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EXTIRPATION OF THE EYEBALL.

BY JAMES SMITH, M.R.C.V.S., HUNTINGDON.

THERE has recently been some discussion in the VETERINARY JOURNAL regarding this operation, and this leads me to send the history of a case in which it was recently performed.

The subject was a five-year-old cart gelding, which had received an injury to the eye some eighteen months previously. When I saw it about a month ago, the eye presented itself as a large granulating mass, protruding from the orbit about one and a-half inches, from which there was a continual sanious discharge. I at once recommended that the eye should be removed.

Mr. C. Burston, M.R.C.V.S., of St. Neots, very kindly accompanied me, and afforded both manual and moral assistance during the operation.

As soon as the horse was down, the membrana nictitans was seized with a hook and dissected out. The palpebral fissure was then enlarged at the external canthus, and the conjunctival folds and oblique muscles cut through. During this stage of the operation there was a little hæmorrhage. The chain of an ecraseur was then put round the eyeball and pressed to the bottom of the orbit, and held there until it was tightened. The ecraseur was now slowly and steadily drawn home, and as soon as this was accomplished, the eyeball dropped out. There was no hæmorrhage whatever. The division in the canthus was stitched up and a plug of cotton wool, soaked in carbolised oil, was put into the orbit, one stitch being loosely put in the eyelids, to retain the dressing in its place.

The horse received a dose of physic as soon as the operation was over. Forty-eight hours after, the dressing was removed, and the orbit syringed out with carbolic lotion. I saw the owner on the

fifth day after the operation, and he said he had sent the horse to work.

Remarks. There can be no doubt, from the size of the eyeball and the time during which it had been diseased, that the *arteria centralis retinæ* was considerably enlarged, and I attribute the total absence of hæmorrhage to the use of the ecraseur. In my opinion, this is an operation, *par excellence*, in which this instrument is invaluable.

INVASION OF THE MESENTERIC ARTERIES OF THE HORSE BY THE STRONGYLUS ARMATUS.

BY W. L. WILLIAMS, V.S., BLOOMINGTON, ILLINOIS, U.S.A.

(*Continued from page* 164.)

Case No. 3. A common black gelding, used at farm work, was well kept and in good health to day of death, when he was suddenly seized with colicky symptoms, but upon our arrival, soon after, was cold, pulseless, breathing heavily, trembling, etc., and soon died; the autopsy showing gangrene of large colon, and large mesenteric artery occluded by parasitic thrombus, the only discernible cause for the fatal Enteritis.

Case No. 4. A full-blood French draft colt, *æt.* one year, large and strong, well kept, stabled at night, and run at grass in day. Became ill May 24th, 1886, at first with slight colicky pains, dull and indefinite in character, apparently less violent than ordinary Colic, and yet without those marked intermissions and exacerbations of pain, pulse quickened slightly, temperature scarcely abnormal (102° F.), respirations hurried, with an anxious expression about the eyes, and some congestion of visible mucous membranes, occasional passage of fæces. The animal generally preferred the recumbent position, and lay quietly much of the time, sometimes on chest, at other times extended on his side, rolled occasionally, and, when standing, pawed some, or walked about listlessly.

These symptoms early became aggravated by tympany, necessitating puncturing of the colon, which alleviated and modified the symptoms, but failed to afford that sense of relief expected after puncturing in Colic. Stimulants and carminatives were administered without effect. Cathartic dose of aloes and linseed oil was given at outset. Chloral hydrate was given in pill, in sufficient quantity to modify pain, and trocar used as often as tympany produced dyspnœa, which occurred three or four times during first twenty-four hours.

May 25th. Colt free from pain, but dull; no appetite, drooping head, quickened pulse and respiration, temperature 103°, abundant

intestinal murmurs, giving promise of early purgation. Ordered stimulants and tonics.

May 26th.—Colt brighter, pulse somewhat weaker, but fair, bowels responding gently but freely, to purgative, and colt takes some food. Continued same treatment as 25th.

May 27th.—Much worse, lies down nearly all the time, and trembles continually when standing; temperature 105°.

Died during the following night, and *post-mortem* the next morning showed bowels somewhat congested throughout entire length, and thickly studded over with hæmorrhagic infarctions. Scattered here and there, attached to peritoneal surface of bowels and mesentery, or inside of bowels, or buried beneath peritoneum of sublumbar region, were numerous strongyles, about 2 ins. long. The great mesenteric artery contained several large thrombi and many strongyles. These thrombi invade all three fasciculi—right, left, and anterior; the latter evidently suffering most, being so completely occluded, that the arterial branches leaving this fasciculus are so much atrophied as to scarcely be seen. The left fasciculus, in addition to the thrombus at point of origin, is greatly elongated, and before finally dividing up into the usual branches contains another thrombus, the size of a walnut, separated from the first by a contracted neck. In this case there was no intestinal gangrene, death probably having been due to exhaustion from the long-continued pain, and to the toxic effect of the vitiated blood emanating from the anæmic and congested bowels.

Case No. 5. A high-grade French draft colt, *æt.* at death two years, had been well kept on good pasture, had good appetite, yet had looked starved and emaciated, and smaller than its fellows for nearly a year. Attention first called to colt November 21st, 1885, when he showed a peculiar stiffness, mainly in the left hind leg, attributed to disease of stifle joint, and supposed to be accidental, while his general bad condition was attributed to worms; and vermifuges were administered, without, however, any expulsion of worms, and this was followed with tonics. For awhile the colt would improve, then grow worse again. At one time he would appear stiff in one hind leg, then in the loins, and then go quite well for a time.

We saw the colt frequently during visits to other stock on the farm, but adopted no vigorous treatment, relying upon time and tonics—mainly the former—to effect a cure, but each time he grew worse; he never fully regained his former condition, and continued, on the whole, to lose ground during the entire winter of 1885-6, and up to midsummer following.

Was called to see him July 26th, he having several times previously during spring and summer suffered from a kind of Colic of

a rather dull, transient character; but this attack was much worse than the others, there being great agony, breathing hard, sweating, pulse full and bounding, temperature slightly elevated, only slight intestinal murmur; he lay down most of the time, and when standing generally stood with hind and fore-feet extended as far apart as possible, as is frequently seen in infarction of colon.

Stimulants, tonics, cathartics, etc., were tried without avail; and the colt died two days later, July 28th, and another forty-eight hours elapsed before an autopsy was practicable, and the weather being warm, the body was so decomposed that a careful autopsy was impossible; but we ventured far enough to find that the abdomen contained much bloody serum and blood coagula, and in the renal region we found a tumour the size of a peck measure or larger, and to it adhering on every side, and in utter confusion, large and small bowels. The mesenteric lymphatic glands were greatly swollen, both about the tumour and those along the intestines. Cutting into tumour, much clotted blood was found, which when removed revealed an aneurism of the great mesenteric artery the size of a man's head, ruptured at lower part, and scattered here and there emboli, evidently of a parasitic origin. The arterial walls of the aneurism were fully one inch in thickness, composed apparently almost entirely of yellow elastic tissue.

Case No. 6. A full-blood French draft colt, *æt.* one and a half years, large, healthy, and in good condition to date of death. He was found unwell on the morning of August 23rd, 1886, and we were at once called, and found the animal suffering intensely, lying down most of the time, but not rolling, his favourite position being on his chest, with fore-legs extended, and head swaying to and fro, or resting his nose on his legs or the ground in a semi-unconscious manner; breathing hurried and painful; pulse quick.

Manual exploration, per rectum, revealed aneurism of great mesenteric artery, plainly discernible to the touch; pulsation full and bounding just above, while below aneurism it was imperceptible. Autopsy next morning showed innumerable strongyles scattered everywhere in abdomen, bowels considerably inflamed throughout, with abundant hæmorrhagic infarctions. Imbedded in connective tissue, beneath peritoneum in renal and sublumbar regions, were numerous strongyles, two inches long, coiled up like trichinæ, some surrounded by blood, apparently in small aneurismal dilatation of small veins, some in liquid pus, some in old caseous pus.

The great mesenteric artery contained probably 100 strongyles of large size, attached to arterial walls, producing extensive and severe Endarteritis, with the consequent aneurism and thrombi. The right fasciculus was completely occluded, while the anterior fasciculus contained large thrombus occluding retrograde colic

artery, thus cutting off blood-supply to large colon and cæcum, whilst left fasciculus escapes, as does also one branch of the anterior—the first artery of small colon.

Case No. 7. A grade French draft colt, *æt.* two months, in good health to date of death, was found sick on the morning of Oct. 29th, 1886, and, upon our arrival, found the colt in great pain, lying down almost constantly on its back, breathing hurried and painful, pulse quick, temperature normal; groaned almost constantly. Scarcely rolled at all, except to balance himself on his back, and, when driven up, would stand for a few minutes only. Gave stimulants and carminatives without effect, and oleaginous purgative, which produced abundant peristalsis in small intestines for a time, but when they had emptied their contents into large intestines, there was no further intestinal murmur.

Autopsy next morning showed extensive gangrene of cæcum and large colon, unusually black in colour, and here and there in the abdomen were seen wandering strongyles, while in the large mesenteric artery were numerous very small immature strongyles, and large thrombus filling entire artery and extending into all the fasciculi; and, as in the other cases, the right fasciculus suffered most, in the first part of which we found large parietal thrombus, inside of which we found another extensive thrombus, for the most part detached from the former, and consisting mainly, in centre, of blood coagula, while between it and the parietal thrombus there was an abundance of reddish-grey puriform material, apparently part pus, part red blood-corpuscles, and part *débris* from the breaking down of thrombus. Judging from the character of the thrombus and the gangrenous bowel, we would consider death, in this case, to be due to Pyæmic Enteritis.

Case No. 8. A highly-bred trotting-mare, *æt.* 3½ years, never worked, but run at grass, raised a colt during the summer of 1886, and was again in foal, and was in fair flesh and feeling well up to early autumn, when she began losing flesh unaccountably, and became quite weak.

We were consulted Sept. 13th, 1886, and prescribed tonics and vermifuges, and on Sept. 21st she became somewhat colicky, which stimulants and oleaginous aperient somewhat relieved, this being followed up on Sept. 22nd and 24th by tonics; but on Sept. 30th, the mare still being quite unwell and losing flesh and strength rapidly, she was brought to our infirmary, where oleaginous aperients with carminatives and tonics apparently caused some improvement in flesh and strength, and all seemed to be going well, when on Oct. 5th she aborted, which misfortune offset all that had been gained, and left her weaker than ever; but she soon rallied and was discharged improved, Oct. 17th, and when turned

out to grass again gained rapidly in condition and life. On Nov. 3rd, we were called hurriedly to see her, and found her breathing quickly, pulse rapid, temperature normal, lying down most of the time, rather quiet; but symptoms soon became more aggravated by slight tympany, and eructations of gas from stomach began to take place rapidly, soon followed by attempts at vomition, sweating, trembling, and in a few minutes she fell forward, dead.

Autopsy showed large rupture of stomach, and escape of contents into peritoneal cavity, and attached to and imbedded beneath peritoneum, were seen numerous strongyles. The cœliac axis and right and anterior fasciculi of great mesenteric artery were occluded by parasitic thrombi.

The small bowels (supplied by the non-occluded left fasciculus of great mesenteric artery), seemed healthy and competent for their work, while the stomach and colon contained abnormal amounts of food. What part did the thrombus of the cœliac axis play in producing the fatal rupture of the stomach? Certainly such occlusion of the artery supplying the coats of the stomach and, added thereto, such serious interference with the collateral supply from the great mesenteric could not avoid crippling the digestive powers of that organ.

*Case No. 9. A high-grade French draft gelding, *æt.* two years, on same farm, and belonging to same owner as Nos. 5 and 7, was in good condition and thrifty, and never sick until Dec. 29th, 1886, when he had slight attack of dull colicky pains, which lasted for a few hours, when he ate some, and appeared almost as well as usual; but his condition was such as to lead the owner to believe that he was affected similarly to Nos. 5 and 7, and the next day, Dec. 30th, the colt being worse again, we were called, and found the animal trembling, pulseless, temperature normal, respirations hurried, standing all the time.

Autopsy on Dec. 31st revealed large thrombi in cœliac axis, great mesenteric arteries, and posterior aorta, with numerous strongyles in the thrombi, and the bowels were considerably inflamed throughout their entire length.

From the foregoing, we think it has been plainly shown that, whatever may be true of the occurrence of this affection in England, it is not rare in our breeding districts, neither does it affect mainly aged and worthless animals, there being in the foregoing list but one aged animal, while six cases occurred in animals less than two years old; and, further, we have shown that the invasions of these parasites may prove fatal at an earlier age

* Added since the original reading of the paper before the Ill. Vet. Medical Association, at Chicago, Nov., 1886.

than previously recorded—six months—Case No. 7 having occurred in a colt two months old.

The symptomatology of this affection varies considerably in different cases, owing in part to suddenness, location, and extent of the invasion, as also to whether the symptoms proceed from thrombosis or embolism, or other immediate cause.

We may, therefore, expect that in rather old animals, and in case of thrombi of long standing, the symptoms should be those of embolism, sudden and severe in character, and terminating early, as in No. 1, either in recovery by collateral circulation, or, in event of failure for this to promptly take place, in death; while, in other cases, by detachment of emboli into aorta or iliacs may produce more or less serious anæmic paralysis of the parts supplied by the affected vessels.

In other cases, as Nos. 5 and 8, where the invasion would appear to be gradual, we see repeated dull colics, with gradual emaciation from inanition, owing to the deficient blood supply to intestinal tract; while in others, like Nos. 4, 6, and 9, by rapid and extensive development of the thrombus, finally the circulation becomes rather suddenly arrested, promptly followed by fatal lesions; and in No. 7, in addition to the above, Pyæmia, no doubt, played an important part, rendering the disease still more rapidly fatal.

In general, we note usually a peculiar dull, extremely agonising pain, without that violence (except No. 1) usually observed in Colic, also generally less tympany and a want of those characteristic exacerbations and periods of relief.

The pulse and respirations are more uniformly accelerated than in Colic, and there is a peculiar, anxious expression about the animal that bodes no good, and leads one to conclude that he is dealing neither with ordinary Colic nor Enteritis.

The temperature is usually normal until late in the attack, sometimes throughout. Finally, a positive diagnosis is generally available, as in No. 6, by manual exploration, per rectum, Nos. 4, 5, and 9, having been even better subjects for such diagnosis than No. 6.

But in very large animals, like No. 1, or in small ones, like No. 7, this means is not available, and in some others a very delicate touch would be requisite for certain diagnosis. How often these parasitic thrombi occur amongst our horses we do not attempt to say, since during our research after Case No. 3, we have only looked for strongyles where they have been expected, and have not been disappointed in any case. Except Nos. 1 and 3, all animals run at grass and were not worked, and we also note that the last two seasons (covering six cases) have been rather wet, and the pastures have been unusually luxuriant, circumstances

which, according to our available life-history of the Strongylus armatus, are peculiarly favourable to its development.

To some it may seem singular that the disease in the foregoing cases has occurred mainly in French draft colts, but this is readily explained by the fact that our county (M'Lean County, Illinois) is largely devoted to rearing horses almost exclusively of this breed.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 16.)

THE lateral cartilages are liable to become ossified, especially in the heavy draught and coarse-bred horses; and well-bred ones are not entirely free from the disease. Many horses are the subject of this disorganization of structure, and are passed as sound, and free from disease, by the veterinarian; in some instances by being overlooked, and in others, in consequence of the examiner not deeming it necessary to make any remark. Some men are desirous of earning the name of *good fellows*, and of becoming popular with breeders and dealers in horses. In order to accomplish this they are not over particular in their examinations as to soundness; we often hear remarks as to the manner Mr. So-and-so passes *his horses*. I do not wonder at the neophyte adopting this course, more particularly when he has to contend with "vieux routier." It is common to hear some people say they object to a certain man as he is very particular—that is to say, when selling, but not when buying; they do not care how you scrutinize a horse when they have to pay the purchase-money. I have been told by farmers that a "vet." ought to overlook many little things when a *gentleman* is the purchaser, because he can well afford to lose his money if anything goes amiss. Sellers of horses, as a general rule, are not sufficiently versed in what constitutes the duties of an examiner as to soundness; indeed, I have known some *gentlemen* give a hint to the "vet." not to look more closely than needs be. When this suggestion is made, he ought to take extra pains in examining his case. But this is a digression, and now to proceed.

We all know how prone the horse is to the deposition of bony matter upon various parts of his frame when a sufficient exciting cause has called it forth. We find cases of substitution also very frequent as we approach towards the pedal extremity; for example, this substitution is met with *between* the metacarpal bones and in cartilaginous structures generally, when contiguous to the bones. The lateral cartilages are, as I have said, especially liable to the change of structure adverted to, in certain bred horses. These appendages, too, often feel like dried gutta-percha, and are curled

towards their posterior parts, which must to a certain extent impair the action of the animal so circumstanced. Being intended to protect certain parts by warding off concussion, they should be pliable. Much may be said of these bodies, were it necessary. I know of no portion of the anatomy of the horse more overlooked by some persons than the lateral cartilages, and I have no doubt much diversity of opinion will exist as to a diseased condition of the parts being considered an unsoundness when, of course, the disease has rendered them but slightly rigid. It is usual to certify an animal sound if no lameness is apparent. Since these observations were first shown to light, I have seen a good deal more of the disease in question, and cannot avoid remarking that it is extraordinary what amount of disease exists in some cases without in any way interfering—apparently—with the action of the animal. I have seen instances when the cartilages have grown to a very great size, and have not caused lameness; whilst in others I have seen the most acute symptoms present indicating pain. A specimen is at present in my collection, which I obtained some years since, in this way. A mare was attacked with pain abdominal, and I was requested to visit her, which I did, and the mare soon recovered after the attention, etc., given to her. Being rather hurried in practice about that time, I did not apply for payment of fee, but allowed the owner, a farmer, to take his own time. In the course of a year he called to settle, and said the mare that I cured he had had sent to the kennel. I inquired what the cause was, when he said that she was so lame that she was unable to work, and that he had shown her to several horse-doctors, who told him the animal could not to be cured. As a matter of course, I inquired why he did not consult me about it, as, in all probability, something might have been done. He stated that the day previous to his visit, she was sent to the kennel. After ascertaining her colour, etc., I took means to have the leg of the mare, with a view of examining the part affected. The specimen is certainly a good one, and no doubt she was very lame, but I was of opinion that there was no need of sacrificing her. I have every reason to believe that thousands of horses have disease of the lateral cartilages, pass examinations as to soundness, and perform their work equally well with those animals free from disease, for many years; and I may go further, and assert that they—some of them—never have shown the slightest symptom of lameness. With these experiences, therefore, it should be a warning to us not to hurriedly condemn an animal as being unsound until we have given a somewhat severe test of capability. If all animals having disease at the time of purchase and examination be treated as the law directs, but few indeed would change ownership. It must not be forgotten what learned

judges have had to say about soundness, when trying cases in their courts, "that sound means sound," and so forth. It must be admitted that veterinary surgeons are expected to be capable of judging whether disease of any description is likely to prevent the usefulness of animals, or not; but, with all the care, after a very long experience in this branch of the duties imposed upon us, we are now and then liable to err. I pass over that disease called "Quittor," not believing any person would subject an animal to the ordeal with such a disease apparent. The next to catch the eye is a *sore heel;* this is generally looked upon as a very trivial affair, and unworthy of notice. A word or two, however, may not be unprofitably employed in discussing the merits of this apparently trifling ailment. I omitted to mention, not deeming it necessary, that when practicable the legs and feet should be well-cleansed from dirt, either by water or otherwise, previous to the examination, as it is possible the eye may be deceived during the process. A slight crack in the heel, or a fissure may exist in the bony part of the the foot, which might escape detection, unless this precaution be taken. Sore heels, cracked heels, or, as some persons describe these affections, *scratched* heels, will (although considered by many of no consequence) sometimes cause a great deal of mischief. Such affections occasionally develop into a very serious affair, and become confirmed *grease*, and subsequently that known as *grapes*. But, of late years, the improved system of stable management seems to have completely got rid of this complaint—at least it is but seldom that I meet with such a case. A word in season will tend to ward off evil consequences. Lameness is often the result of a sore heel, and if it should happen that a splint is present on the limb of the same side, it is more than probable the lameness will be attributed to the splint and not to the slight crack in the heel. These mistakes are not unfrequent. Mr. Percivall mentions a case in part i., vol. iv. of his "Hippopathology," which will teach a better lesson than I am capable of doing.

PERIODONTITIS IN AN OLD HORSE.

BY D. C. PALLIN, A.V.D., DORCHESTER.

WITHIN the last few days, a most peculiar case came under my notice.

An old dairyman who supplies our barracks with milk, asked me to have a look at his pony, which, he said, was not doing as well as usual.

On making inquiries, I was somewhat astonished to find the animal was in the thirty-first year of his age, a circumstance which at once caused me to make an examination of the mouth. I found

the incisor teeth very long, and they protruded from the superior and inferior maxillary bones, so as to be almost parallel. The canine teeth were encrusted with tartar to the depth of about half an inch, so that when the mouth was closed the incisors were prevented from meeting. The corners of the molars were very long and sharp, causing in many places abrasion of the cheeks.

With a view to giving the animal relief, I lost no time in removing the tartar from the canine teeth by means of a chisel, after which I endeavoured to rasp the molars. In this, I experienced some difficulty, as I found them all more or less loose in their sockets, due to "Periodontitis." With care, however, the difficulty was got over, as they were so brittle that the least touch of the rasp was sufficient to remove the excessive growths.

Strange to say, I could discover no trace of decay, and the breath seemed natural and healthy. The animal has been fed on mash diet for the past ten years, and continues to do his regular work. The owner informs me that the operation has proved beneficial. With the exception of the "Periodontitis," the animal seems quite healthy.

A NEW INFECTIOUS DISEASE OF HORSES, CAUSED BY THE ACTION OF THE RUST FUNGUS.

BY VETERINARY SURGEON R. W. BURKE, A.V.D., CAWNPORE.

On the 22nd October last I was requested by the officer commanding 6th Bengal Cavalry in Cawnpore to inquire into the cause of death of several horses belonging to his regiment which were suffering from Acute Narcotica—irritant poisoning—the nature of which had not, till then, been clearly determined.

I arrived at the cavalry lines at about eight p.m., and found twenty horses down with the disease. Three horses had died before my arrival. Next day thirty-seven admissions had taken place, and there were six deaths more by twelve o'clock noon. Altogether fifteen animals have died up to moment of writing this report, and several animals are not expected to recover.

Symptoms.—The principal symptoms were:—Diarrhœa and palpitation of the heart, attended with more or less degrees of fever, the average temperature of the rectum being 103° Fahrenheit. The pupils were dilated in many cases; the pulse was weak, thready, and sixty-eight beats per minute, and there was marked tympany in the advanced stages. Muscular tremors, especially of the hind limbs, were marked during the latter stages, due to vascular pluggings, shown *post-mortem*. There was great thirst, and suppression of the urine in some cases. The eyes were sunken, the result of severe diarrhœa, the same as in Cholera in man, and constituted a prominent symptom during the latter stages.

Etiology.—Inquiry showed that the horses in question had received grass procured from a new source; it appeared coarse, and contained a thick deposit of fungus both on its stem and leaves, having a dark appearance and a sickly odour. Microscopic examination at once showed the cause of mischief, namely, abundant growth of the rust fungus, or *puccinia graminis*, formerly known under the name of *uredo rubigo* and *linearis*. A couple of ponies, afterwards fed on this grass containing the fungus, succumbed to the disease in a few hours.

Development.—It was ascertained that in the majority of cases the average period from the time of feeding on the above grass to first manifestation of the symptoms peculiar to this disease was no more than eighteen hours, although a few cases were more prolonged in consequence of a smaller quantity of grass having been taken, and probably also owing to different powers of resistance possessed by different horses. The shortest period was found to be eight hours.

Duration and Course.—The average duration of the disease was between eight to twelve hours, only a few cases being prolonged to twenty-four hours and more, after which the prognosis was generally favourable if a relapse did not occur.

Prognosis.—The prognosis was generally unfavourable. It was most unfavourable when palpitation of the heart was a marked symptom. Tympany, due to paralysis of the muscular coats of the intestines, was also an unfavourable sign. Convulsions preceded death in most cases.

Pathological Anatomy.—Lesions of severe gastro-enteritis; multiple thromboses of the blood-vessels, in some cases, of the smallest arterioles, in which muscular tremors in the limbs existed during life. Blood of a dark, approaching to black, colour, and in firm clots. The heart contained dark blood, and its muscular walls were hypertrophied.

Treatment.—Opium, sulphuric acid, acetic acid, vinegar, ginger, camphor, cinnamon, etc., to check the diarrhœa. Carbonate of ammonia in cases showing cardiac complications with interference of circulation due to plugging of the blood-vessels. Warm water enemata and local fomentation of the abdomen. Soda bicarb., potass. nitras, etc., in water to drink. Linseed tea, rice-cánjee, milk, etc., as nutrient, emollient drinks.

Prevention.—Stopping the issue of the grass at once terminated the disease, and there were no fresh admissions into hospital.

The uncertainty of the modes of grass-supply in regiments of Cavalry and Artillery in India forbids any confident anticipation that disease will be prevented in the future; so much will depend on how the grass scheme is going to work at the various stations.

Editorial.

THE PATHOLOGY AND TREATMENT OF ROARING.

It would be interesting to learn whether the morbid condition in horses which gives rise, among other symptoms, to the respiratory manifestation commonly known as "roaring," and which has been technically designated *Laryngismus Paralyticus*, is on the increase, and if so upon what the increase depends.

From the evidence which is at present to hand, it would certainly seem that "roaring" is more frequently observed than it was, say, half a century ago, and that this frequency is most notable among the better bred horses. Of the serious nature of the disease which produces this noise in breathing, there can be no doubt, as it is generally considered beyond the range of remedial measures; while it gravely depreciates the value of animals affected with it, because not only does it unfit them, to a greater or lesser degree for performing their special work, but in consequence of its being looked upon as hereditary or transmissible, the stallion or mare so affected is not to be recommended for breeding purposes. Horses which are required for speed and severe exertion could scarcely have a more objectionable failing than "roaring," and though it is a fact that "roarers" can sometimes undergo the strain of galloping and other violent respiratory tests, without exhibiting much visible distress that might be ascribed to the laryngeal obstruction, yet the sound is always unpleasant to the listener, and the defect only too often becomes more developed the longer it exists, until at last it occasions such serious dyspnœa during labour that the horse has to be destroyed, or can only be utilised by wearing a tube in the trachea, below the seat of stricture.

For a long time the pathology of "roaring" was obscure, and even now opinions differ as to its origin, and whether it is a neurotic or myotic disorder. A very prevalent notion among those who believe in its neurotic nature, and who are perfectly cognisant of the fact that the immediate cause for the production of the noise is atrophy of the left dilator muscle of the larynx, is that the left recurrent nerve, in passing behind the aorta, and between it and the left bronchus, sustains such an amount of compression that its conductibility is impaired, and the muscles it animates consequently degenerate. But this is a mere hypothesis, and will not bear examination. In the first place, in man and in many other of the domesticated animals than the horse, the nerve has exactly the same relations with the aorta, and yet "roaring" in them is only observed when there is evident compression of the pneumogastric or inferior laryngeal by an aneurism, tumour, or other very evident agency. Again, very many horses are, fortunately, not "roarers," and yet their left recurrent has exactly the same anatomical disposition, while the animals live and labour under the same conditions, as those which roar. Besides, in some climates "roaring" is almost unknown, which would not be the case if its production depended upon aortic compression; while in other climates—Egypt and South Africa, for

example—horses sent from England very often become affected, though the exertion they undergo is perhaps not so exacting as at home.

But we may ask if such aortic compression of the nerve can really take place? We are satisfied it cannot. The alternate dilatation and contraction of the aorta has no influence on the function of the recurrent, as this is in no way fixed to the vessel, nor yet is it a rigid, unyielding cord liable to injury by stretching, even were it subjected to strain from the dilating of the great arterial tube.

The only rational explanation of the cause of "roaring" is that which is supported by abundant clinical and pathological observations, as well as the evidence afforded by morbid anatomy: Compression of the nerve either by the bronchial glands, or by tumours or indurations on its course towards the larynx. Of these, in perhaps nearly every case it is the bronchial lymphatic glands. In this Journal for January and February, 1882, there appeared an article on the subject, in which this view of the pathology of "roaring," accepting the designation as applicable to a morbid condition, was promulgated for, we believe, the first time, and the treatment based on this view was described, cases being alluded to in which amelioration had taken place on the adoption of the treatment, one case in particular being perfectly cured. Accepting the laryngeal muscular atrophy as being due to loss of conductibility of the recurrent nerve, this again being caused by a diseased condition of the bronchial lymphatic glands, which implicates the nerve, the indications for treatment are apparent. These are: remove the morbid state of the glands by the administration of medicines which have a specific action upon them; while at the same time the function of the nerve is restored or maintained, and the dilator muscle of the larynx consequently stimulated to exercise and healthy action, by Faradisation applied as frequently as need be. Of course, the success attending this treatment must greatly, if not altogether, depend on the duration and extent of the disease. The earlier it is adopted the more likelihood there will be of a satisfactory result; and it is obvious that in those cases in which the muscle has undergone numerical atrophy or fatty degeneration, no hope can be entertained of any benefit being afforded.

For the first time we now have a clear conception of the nature of the cause which leads to the production of this hitherto intractable disease, or at least to the most common form of "roaring," and can adopt a rational method of treatment based on this knowledge.

The value of this advance in our pathological and therapeutical skill is being put to a rather notable test at the present moment. Ormonde, the property of the Duke of Westminster, and the grandest race-horse of this century, manifested the usual signs of "roaring" so long ago as last October, and these signs have since become more and more marked; so that it may be presumed that the disease has become completely established, and is rather advanced. Treatment based on the new pathological view of the malady was commenced early in March, and is now being continued; the training of the horse going on in the meanwhile, as he is entered for several very important races. It will

be interesting to observe the effects of the Faradisation and the medicine which is being given, and we shall endeavour to keep our readers informed of the progress of the case, which possesses great interest not only for horsemen—for Ormonde becoming unsound from such a cause is almost a national disaster, but for the veterinary profession. If we can prevent or cure, or even modify, "roaring," we shall have achieved something worthy of medical science in this latter half of the nineteenth century.

VETERINARY SCIENCE.—A SKETCH.

BY GEORGE FLEMING, LL.D., F.R.C.V.S., PRINCIPAL VETERINARY SURGEON OF THE ARMY.

THE history of Veterinary Science in this country is so recent as to be almost within the range of memory of many people now living; and certainly its origin dates no further back than the birth of not a few persons, who may yet see some years come and go.

The rapid progress made by this science in recent years, and its immense importance to civilization, are not unworthy of consideration by those who interest themselves in promoting science in general, or in watching its progress; as well as those who are desirous of seeing the national wealth and the national health increase, and humanity to animals more largely prevail. Among the many great and beneficial changes which have taken place during Her Gracious Majesty's glorious reign, the advance which has been made in this science is especially noteworthy, and the circumstances under which this improvement has been effected are not the least remarkable of the many events which have marked this long period. It may be, therefore, not inappropriate if, on this Her Majesty's Jubilee year, we bestow some notice on what may be considered as an almost new branch of medicine and science, and briefly survey its development, its course, and its requirements in this country.

If we reflect on the immense extent of our empire, and its continuous expansion; the enormous number of domesticated animals it contains, and their increasing value; the fact that these animals are exposed to the invasion of terribly destructive pestilences, whose appearance is nearly always accompanied by consternation, panic, and ruin to agriculture; and also that a number of animal diseases are communicable to mankind, to whom they are generally fatal; it will be seen that the public should entertain more than a passing interest in veterinary medicine, even if the claims to humane treatment of the animals we use for our benefit, either in their utilisation, or while suffering from illness or accidental injury, did not move our regard. Every year, almost every day, is bringing into greater prominence the necessity for cultivating this science to the highest degree,—a necessity which is rendered all the more obvious by the startling discoveries now being made in the relationship between the diseases of man and beast, and the means of suppressing or preventing contagious disorders. The many distinguished scientists whose names figure in the history of veterinary medicine, have already accomplished much, even when labouring under grave disadvantages, such as have been met with in this country; but much yet remains to be done, and there is great scope for observation and research in this wide field of comparative medicine, sanitary science, and rural economy.

Though France, Austria, Prussia, Denmark, Italy, Sardinia, Saxony, Bavaria, Baden, and Hanover, had already established veterinary schools

for the systematic teaching of animal medicine and surgery, by skilled and specially trained professors, yet it was not until 1791, that, through the efforts of the Odiham Agriculture Society, the first teaching establishment was instituted in London. Previous to that time, the diseases and injuries of the domesticated animals were attended to by the illiterate shoer of horses or "farrier," or equally ignorant men, who, despising the laborious calling of the *faber ferrarius*, acted as specialists under the designations of "horse-doctor" or "cow-leech." An individual of this description figures in Hogarth's "Enraged Physician," where he is seen, mounted on horse-back, blowing a horn to announce his whereabouts to those who require his aid; and on his body is a cross-belt, embroidered with horse shoes, emblematical of his designation and the origin of his calling, while he carries a wallet containing his drugs and instruments. Now and again, it is true, an enthusiastic medical man, educated sportsman, or lover of animals, would take up the subject and endeavour to place it on a better basis, but generally with very little success. The universal ignorance prevailing with regard to everything pertaining to the management of horses, cattle and dogs, but particularly the two former, whether in health or sickness, is startingly evident from the books written in the seventeenth and eighteenth centuries, and also from the accessible records of the prevalent diseases, and the losses these caused. During the whole of the last century, chiefly through the wars prevailing, and the consequent movements of large armies, the continent of Europe had been devastated by the Cattle-plague; and the havoc it occasioned everywhere it appeared was so considerable as to paralyse agriculture, and produce most ruinous results. In my work on "Animal Plagues" (vol I.), I have computed that in Western Europe alone, from 1711 to 1769, no fewer than 200,000,000 head of cattle, not to mention sheep, or other ruminants, perished from the disease. Indeed, it was chiefly owing to the ravages it occasioned that serious attention was attracted to the necessity for devising measures for combating such a terrible affliction. Though the Greeks and the Romans had recognised the close relationship existing between Agriculture and Veterinary Medicine, and though they also had painful experience of the effects of "murrains" among their cattle and sheep, and were even aware of the communicability of at least one fatal disease of animals to mankind; yet their knowledge did not enable them to prevent the invasion of decimating plagues, nor enable them to suppress these when they had gained a footing among their herds and flocks. Evidence of such appalling visitations of the Cattle Plague is to be found in the historians of these early periods, and we are often enabled to trace the course of the contagion from the country in which it constantly prevailed to those which, in consequence of wars or migrations of races of men, as the Mongols and Huns, it was carried; and the terror and lamentations to which these irruptions of the "lues bovina" gave rise, is not the least notable feature in these narratives. In the curious poem, *De Mortibus Boum*, written in dialogue form by Sanctus Severus, one of the earliest Christian poets, we find, following the description of the Cattle-plague and the plaintive account of its destructiveness among the toiling oxen, mention made of its progress:—

> "Hæc jam dira lues serpere dicitur,
> Pridem Pannonios, Illyricos quoque
> Et Belgas graviter stravit, et impio
> Cursu nos quoque nunc petit."

It was reserved for France to take the first great step in this direction, and that the most certain and beneficial one possible. Buffon, the great naturalist, had previously recommended the formation of veterinary schools, but his recommendations were not attended to, and it was reserved for the illustrious Bourgelat, an advocate at Lyons, and a most talented hippologist, through his

influence with the sagacious Bertin, Prime Minister under Louis XV., to induce the Government to establish a Veterinary School and School of Equitation at Lyons in 1761. Previous to this period, as with other countries, France had only schools of human medicine, and did not yet understand the value of special schools of an agricultural or industrial kind. There is nothing astonishing in this. At the time when Bourgelat thought it necessary to reform hippology, and establish animal medicine and surgery on a sound basis, agricultural France, like other agricultural countries, read little indeed, and followed the methods which had been in vogue from time immemorial, without ever being moved to consider whether others more rational and profitable could be introduced. It is true that it possessed the *Theâtre d'Agriculture* and some other elementary agricultural works; but these books were little read, and they were probably unknown to the gentlemen who played *à la pastorale* in the gardens of Chantilly or Versailles. It is true also that the writings of Oliver de Serres, the author of *Mesnage des Champs, Maison Rustique*, and the *Discours Admirables*, were published, as well as those of Bernard de Palissy and Duhamel de Monceau, who, inspired by the ideas of our own countryman, Tull, gave France his *Elements d'Agriculture* and the *Traité sur la culture des Terres*, in which he pointed out the prejudices existing at that time against all improvements in the cultivation of the soil, and the rearing and management of useful animals. But French farmers of those days were evidently imbued with the Catonian maxim, which they rendered in their own fashion. "Ne change pas ton soc," while they clung tenaciously to the motto, *Aie pour suspecte tout nouvelleté*. It is also true that these antiquated and damaging notions partially ceased to be entertained and propagated when agricultural societies began to be formed; but, nevertheless, they still reigned supreme until confronted with the new doctrines which were being somewhat rapidly disseminated under the influence of the "renovation" begun by Bourgelat, and during the course of which appeared the economists, Parmentier, Turgot, Vilmorin, Thouin, and so many others who adorned French agriculture towards the end of the last, and commencement of the present century. But it has been acknowledged that Bourgelat, more than all the others, can justly claim to have been the creator of Veterinary Science. He had been the director of the school of equitation and veterinary medicine, established by royal mandate, and which occupied the convent of Les Deux Amis on the right bank of the Soane, at Lyons; he had written a classical *Traité complet d'Equitation*, had published his *Elements d'Hippiatrique*, and was one of the most brilliant coadjutors of Diderot and D'Alembert, the editors of the famous *Grande Encyclopedie*. This illustrious reformer and amateur veterinarian directed the Lyons School for only a few years; during which the great benefits that had resulted from its establishment had more than realised the anticipations of the prescient Bertin, and justified an extension of the new teaching to other parts of France. Bourgelat, therefore, acting under the inspiration of the Prime Minister, resolved to leave his native town and found at Alfort, near Paris, a second veterinary school, which was soon to become, as it has remained to this day, one of the finest and most advanced of all the veterinary schools in the world. This transfer of Bourgelat to the French capital, though in some respects a misfortune for Lyons, yet was undoubtedly a happy circumstance, so far as French agriculture was concerned, for he was replaced by the Abbé Rozier. This learned agriculturist, besides being well skilled in physics and botany, had been a diligent student with his predecessor, and had abundantly profited by his instruction. He was, therefore, more than Bourgelat, particularly fitted for bringing home to the minds of agriculturists the necessity for accepting the teachings of veterinary science, if they wished to make their vocation progressive and more profitable, and were anxious to be spared from those desolating diseases and everyday losses among their

animals, with which they had only been too familiar for ages. Rozier was killed at the siege of Lyons, after a very successful period of school management, during which he had added largely to agricultural and physical knowledge by the publication of his *Journal de Physique* and *Cours a'Agriculture.*

But while the labours of Rozier, at Lyons, were raising veterinary medicine to the position of a science, and elevating agriculture to an advanced degree as an art, the Alfort School, commenced in 1766, twenty years afterwards, and while under the protection of the minister, Berthier de Sauvigny, completed its tutorial staff in receiving three most distinguished professors, whose names still adorn the annals of science, though exactly a century has elapsed since they were appointed: Daubenton, who taught "rural economy"; Vic d' Azyr, who lectured on "comparative anatomy"; Fourcroy, who undertook instruction in "chemistry"; at the same time Gilbert, one of the most brilliant pupils of the school, had veterinary medicine and surgery for his share. Gilbert was a distinguished agriculturist besides, and published many important treatises on agricultural and veterinary subjects. The position he had acquired by his sound sense, and by his profound and varied knowledge, made him most useful to France during the revolution which distracted that country at the end of the eighteenth century. It is chiefly to him that she became possessed of the celebrated Rambouillet flock of Merino sheep, the conservation of the Tuileries and Versailles parks, and the creation of the fine experimental agricultural establishment organised in the ancient domain of Sceaux, and which he presided over until the directory suppressed it as a measure of economy. He became a joint director of the Alfort School, and at a later period, having accepted the mission of going to Spain to procure the finest sheep that could be found in the "cavagnes" or sheep-folds of Estramadura, he died there. His death was a great loss to veterinary medicine and to agriculture, as was testified by Cuvier, when pronouncing his eulogium at the Institute on his decease.

Owing to the liberality which marked the commencement and the continuance of the Alfort School, and the distinguished men who occupied the chairs, it quickly became the nursery of veterinary science, and the source whence all similar institutions were to obtain their first teachers and their guidance. A third government school was at a later period founded at Toulouse, and the three schools are still flourishing, they having produced, since their foundation, thousands of thoroughly educated veterinary surgeons for the service of the country, and many professors of high scientific repute. Among the latter, in more recent days, we find the name of the lately deceased M. Bouley, President of the Academy of Sciences at his death, Chauveau, Colin, Toussaint, St. Cyr, Goubaux, Arloing, and Galtier.

The creation of the French Veterinary Schools was an event in Europe, and excited much attention among all governments except our own.

Soon after the Alfort School was commenced under such favourable auspices, a national school was established at Vienna, by order of Maria Theresa, and which, remodelled and reorganised by Joseph II., is now the largest in Germany. Prussia quickly followed; for in 1768, so severely had that country suffered from Cattle-plague and kindred scourges, that the distinguished Cothenius, physician to the King of Prussia, brought before the Berlin Academy of Sciences a project for the establishment of a veterinary school in that city. The idea seems to have originated with the King himself, Frederick the Great; but, through the able representations and active interposition of Cothenius, the national school was inaugurated in the capital, and it has proved of incalculable service to Prussia from that to the present time. Soon government schools were founded in the other countries already named, the majority of them being on a munificent scale; while probably all, but especially those of France and Germany, were established

as much with a view to training veterinary surgeons for the army as for the requirements of civil life.

Though England had suffered more or less from pestilential disorders among animals from time immemorial, and in the early and middle centuries had doubtless been visited by that most alarming and devastating of all brute diseases, the Rinderpest or Cattle-plague, yet the embarrassment and distress the malady always occasioned appear never to have been so acutely realised as during its invasions in the first and later portions of the eighteenth century, the latter visitation continuing until nearly the dawn of the present century.

I have elsewhere stated that in the 1745 invasion, 100,000 head of cattle were supposed to have been lost in Lincolnshire in the second year; in the third year more than 40,000 died in Leicestershire and Nottinghamshire; and in about six months of that year 30,000 perished in Cheshire. In the same year 80,000 were killed, under the orders in Council, to prevent the spread of the contagion; and in the following year they were destroyed at the rate of 7,000 a month; but a far larger number perished by the disease. During its prevalence, many hundreds of thousands of cattle must have been lost, and such a deep impression did the catastrophe make, that in some parts of the country their places of interment are still pointed out, and the ravages caused yet linger as a tradition in many agricultural districts. It was doubtless this infliction, together with the losses brought about by ordinary diseases and accidents, as well, perhaps, as rumours of the benefits other countries derived from their veterinary schools, that induced the noblemen and gentlemen who composed the Odiham Society at the end of the last century to resolve upon forming, if possible, a small school of a somewhat experimental kind, in order to rescue sick and injured animals from the maltreatment of the farriers, shepherds, butchers, grooms, coachmen, and charlatans of every description, whose ignorance of medical and surgical knowledge made them bold, but who, in the great majority of instances, could have only added to the misery of their patients and the misfortunes of their employers. It was unfortunate that, unlike all other countries which had established these schools, England should have left this task to private enterprise, and consequently missed the grand opportunity of founding an institution worthy of her position as the foremost agricultural nation, and her manifest destiny as the mother of a great empire, the major portion of which depends upon agriculture for its existence and prosperity. There can be no doubt that this neglect has not been without regrettable consequences, which would have been much more serious but for the energy, judgment, skill, and tenacity of purpose of those who have laboured to keep veterinary science alive and progressive in these islands, notwithstanding the many difficulties and discouragements which would probably have proved fatal to it elsewhere. Probably, if the Odiham Society had not made the attempt in 1791, Government would at a later period have been compelled to adopt the course pursued by all, even the most impecunious and insignificant, of the European States.

It would appear that in 1788, a Monsieur St. Bel (whose real name, however, was Vial, St. Bel being a village near Lyons, where was his paternal estate) visited this country with the object of instituting a veterinary school. This gentleman had studied at the Lyons School, where he became a lecturer and demonstrator, and distinguished himself so much in suppressing outbreaks of contagious disease, and in other ways, that the king had him transferred to Alfort as a junior professor. Here he remained until a misunderstanding arose with another teacher, when he returned to Lyons, but soon went to Montpellier to become demonstrator of comparative anatomy there. Five years afterwards he was sent for to Paris by his patron, the Prince de Lambese, with whom he remained three years, during which time he was

appointed equerry to the king, and chief of the Lyons School, which gave him many opportunities for making further progress in veterinary science, and also in the art of horsemanship, in which he is said to have been very proficient. Failing, however, to regain a chair in the Alfort School, he determined to try his fortune in England, to which he now came, provided with letters of introduction to Sir Joseph Banks, Dr. Layard, and others. In a few months he published proposals for establishing a veterinary school, but these were so coldly received that, having married an accomplished Englishwoman in the meantime, he left for Paris. The Revolution compelling him to fly, in a few months he found himself once more in London, a refugee and in poor circumstances, as his patrimonial estate of St. Bel was forfeited, and an annuity he held was lost by the death of his guardian, who fell a victim to the French mob.

He now determined to settle in this country, and to await an opportunity of making himself known. But for some months he met with no encouragement, and was again on the point of giving up the attempt, when some unexpected and influential patrons arose in Earl Grosvenor and Mr. Granville Penn, who, having just returned from the Continent, where they had inspected the veterinary establishments and noted their utility, determined to give St. Bel their utmost support. It also happened at this juncture that he found an excellent occasion for proving the scientific value of veterinary studies, as he was requested by Mr. O'Kelly to dissect the body of the renowned race-horse Eclipse, which had died from Peritonitis, at the age of twenty-six years. In this task he displayed such great and unusual talents as a veterinary anatomist, as shown in his "Essay on the Proportions of Eclipse," published in 1791, and dedicated to the Prince of Wales, that he immediately gained many influential patrons, among whom were Earls Grosvenor and Morton. In 1790 he again published proposals for founding a school in which to instruct pupils in veterinary medicine and surgery. This time he was more fortunate, for the Agricultural Society of Odiham, which had been meditating sending two young men to the Alfort School to be taught for the benefit of Hampshire, gave up this project, elected St. Bel an honorary member of their Society, and delegated a committee of their number to consult with him respecting his scheme, or whatever might tend to establish a proper mode of treating the diseases of animals in the kingdom. The committee arrived at the following resolution:—"That this meeting, highly sensible of the great benefit that must result to this kingdom from an institution to cultivate and teach veterinary medicine and surgery therein, and also of the plan proposed to them by M. St. Bel (in the views and utility of which they fully coincide), they therefore resolve that a committee, consisting of four gentlemen, be requested to confer with him, and to consolidate, if possible, their intentions with his views."

Some time afterwards it was decided by this committee to detach themselves from the Odiham Society, "for reasons of local convenience," and to form an institution, to be styled the Veterinary College of London, of which M. St. Bel was to be appointed Professor. The school was to be commenced and maintained by private subscription, and funds were soon collected to start the enterprise; for we find that on April 8th, 1791, an organization was decided upon to carry it into effect, having the Duke of Northumberland (who contributed five hundred pounds towards expenses) for President, Earls Grosvenor, Morton, and Oxford, Lord Rivers, and Sirs G. Baker, T. C. Bunbury, W. Fordyce, with the great John Hunter, as Vice-Presidents. The directors included noblemen, clergymen, medical men, agriculturists, and sportsmen, to the number of seventeen.

In March, 1792, arrangements were made for building temporary stabling for fifty horses, and a forge for shoeing, at St. Pancras, and in the following

month, at the request of St. Bel himself, a committee was appointed to inquire into his qualifications in veterinary medicine and surgery. This committee consisted of John Hunter, Drs. Crawford and Packwood, and Surgeons Cline, Horne, Vaux, Sheldon, and Peake; while Earl Morton, Lord Heathfield, and several other noblemen and gentlemen, examined the documents and other proofs of his character and conduct whilst resident in his own country. All this investigation terminated most satisfactorily in favour of St. Bel's abilities and character. The College made rapid progress in public estimation, under the auspices of its highly-competent Professor, notwithstanding some considerable pecuniary embarrassments, the consequence of too extensive building and an ill-judged system adopted by certain persons in the management of its too limited funds. No sooner was the building ready for the reception of animal-patients, than a number of ardent and clever pupils were admitted, some of whom afterwards gained celebrity as able and accomplished veterinarians. Among these may be mentioned the names of Bloxam, Blaine, R. Lawrence, Field, and Bracy Clark, who, in St. Bel's presence, led the first patient into the hospital stables. The Professor was indefatigable in his attention, and succeeded in gaining the confidence of the pupils, and also of the subscribers, in no small degree. But over-sanguine as to immediate benefits, and impatient of everything which tended to obstruct or suspend the success of the institution over which he so ably ruled, St. Bel seems to have experienced much pain when some of its friends and founders died or seceded, and found depressing anxiety in the many difficulties he unavoidably had to encounter. These, added to the distress he suffered from the course of events in his native country, preyed upon a mind naturally very sensitive, and doubtless impaired his health. Seized with a fever in August, 1793, he died in a few days, much regretted. The obituary notice now before us describes him as "a man of distinguished honour and character, of unwearied industry, and first-rate abilities in his profession, whose death is a real loss to this country." His remains were interred in the vault of the Savoy Chapel, in the Strand, at the expense of the Veterinary College; and at a general meeting of the subscribers, an annuity of sixty pounds was granted to his widow, but which had soon to be cancelled, owing to the precarious and decreasing income of the institution. On the death of St. Bel, there appears to have been some difficulty in procuring a suitable successor, but at length, on the recommendation of Hunter and Cline, two medical men were appointed —Coleman and Moorcroft, the latter then practising as a veterinary surgeon in London. The first taught anatomy and physiology, and Moorcroft, after visiting the French schools, undertook to direct the practical portion of the teaching. Unfortunately, neither of these teachers had much experience among animals, nor were they well acquainted with their diseases; but Coleman had the great advantage of having attended Hunter's lectures on physiology and surgery, while he had, as a student, in conjunction with a fellow-student (afterwards Sir Astley Cooper), performed many experiments on animals under the direction of Mr. Cline.

Moorcroft remained only a short time at the college; having been induced to accept a lucrative position in India, he went there, and some years afterwards became a daring traveller, while ostensibly in search of stallions to improve the native breeds of horses. During one of his journeys in 1819, into Thibet, he was murdered by a chief, as we learn from the narrative of his wanderings, published some years ago ("Moorcroft and Trebeck's Travels in Cashmere and Thibet").

(To be continued.)

UPON THE GENERAL DISEASES OF THE OSSEOUS SYSTEM OF HORSES.

By Professor W. Dieckerhoff, Berlin. Extracted from a Lecture delivered to the Veterinary Medical Society of the Province, Brandenburg, on 31st October, 1886.*

The careful clinical, pathological, and etiological investigations which have been carried out in veterinary practice in modern times, have had the result that a number of general diseases which formerly stood under one heading are now shown to be independent affections. Nevertheless, discoveries in this direction have not yet ceased. Many problems in clinical pathology await solution. This refers particularly to the etiology and development of the general diseases of the osseous system of the horse, which have hitherto not been satisfactorily laid bare. My object in directing attention to this subject is principally to contribute to the general knowledge, according to my practical experience; but my observations have not been sufficiently extensive to permit me to give an exhaustive discourse upon the subject.

Before embarking upon my theme, I wish to remind you that the bones of horses are subject to many local maladies. Some of them are caused by external violence; at others again, excessive exertion may set up chronic inflammation of joints, and so on. With these maladies I shall not occupy myself at present.

Disease of the osseous system, when introduced through the blood, may attack the joints, the periosteum, or the marrow, and is accordingly designated Arthritis, Periostitis, or Osteomyelitis.

General inflamation of the joints (Arthritis multiplex, Polyarthritis) arises in the horse, frequently in consequence of pyæmic or septicæmic infection, and also in severe toxic blood diseases (Auto-intoxication). As the patients generally die from these diseases, the secondary results of such multiplex Arthritis are rarely observed. The best known form is the general pyæmic and septic Arthritis of foals, following upon putrid infection of the umbilicus.

In an exactly similar way, hæmorrhagic Synovitis occurs in a number of joints in young and old horses whose circulation has become infected with septic ferments. If the animals survive the general infection, the Arthritis passes off, but it leaves behind it Ecchondrosis and Exostosis, combined with partial disappearance of the articular cartilage, thickening of the synovial, and shortening of the capsular ligament.

These changes are termed "chronic deforming inflammation of joints." There is consequently in horses a Polyarthritis chronica deformans.

Anker (1853), Schrader in Hamburg (1860), Damman (1870), and lately Sticker (1886), have published cases of this malady. I failed to notice in Sticker's case, and in another which came under my observation, that the abnormal condition of the joint gave rise to any particular disturbance, beyond a certain stiffness and slowness of movement in the diseased parts. It would appear that such an Arthritis does not vanish without leaving results behind it, but the horses sometimes recover so completely that they may be worked. Trasbot (1884), however, has recorded a case which ended fatally. In this case, a six year old horse, after being ill for a year and a half, succumbed to Decubitus. I do not agree with those who call this malady a "special polychromic Rheumatism." I do not consider it appropriate, for it differs from the malady thus named in man.

Scrofulous and tubercular Arthritis have not been noticed in horses.

The osseous systems of horses are far less liable to constitutional diseases caused by qualitative defects in their nutrition, than other domesticated

* Translated by F. Raymond, F.R.C.V.S., Army Veterinary Department.

animals. This may be explained by the fact that the organism of horses cannot endure a lengthened departure from its natural food; also, because they are fed for economical reasons upon material rich in albumen and lime. I have never observed brittleness of bone in horses. Stockfleth (Surgery I., p. 416) records that in the district of Jutland several foals sustained fractures under castration.

But I should hesitate to accept these cases as Fragilitas Osseum without further details.

Perhaps these cases were due to some similar cause to that termed "idiopathic brittleness of bone" in man, which can be traced in families as a hereditary occurrence, showing no anatomical change in the bony system which would account for the phenomena.

Rachitis may occur in the first year of existence in foals, but is much more rare than supposed to be by veterinary authors. The error which caused the "lameness" (Lahme) in foals to be put down to rachitic disease of the bones was first exposed by Mr. Bollinger, of Munich. Another error points to Rachitis as the cause of constitutional wasting away (consumption) in foals, whereas it is really due to chronic intestinal affection.

Again, some specialists erroneously put down the congenital general muscular weakness, which is sometimes noticed in foals in the first day after birth, to Rachitis.

I have rarely observed a diseased state of the osseous system in foals in the first month of existence which resembles Rachitis.

I have never seen in foals a condition which resembles that found in the long, round bones of man, dogs, pigs, and young lions in the first days of existence, and caused by Rachitis; and as far as my memory serves me, I cannot recollect anything of the kind in literature. Simple curvatures of the limbs, which are not unfrequently brought about in horses by strain upon them, cannot be attributed to Rachitis.

Hœmatogenous inflammations of the Periosteum, resulting in the formation of minute Hyperostosis, are only rarely found. Veterinary-Surgeon Schliemann was good enough to show me two slaughtered horses, whose entire bony system exhibited this interesting phenomenon. Both horses were fifteen to eighteen years old. All the bones of the head and limbs, except the hock and phalanges, scapula, and patella, were richly sown with small Hyperostosis; some of the bones bristled with pointed out-growths.*

The little bony growths had broad attachments, and sometimes blunt, at others pointed ends. In height they varied from $\frac{1}{4}$ to $\frac{3}{4}$ cm.

It has not been settled by what causes the periosteum of the entire osseous system, in these cases, become hyperplastically excited.

Regarding the general spreading of the abnormal state, I am inclined to believe that at some time an irritating substance of a toxic or infectious description gets into the blood circulation of the horses suffering from the malady, and that this substance, after its introduction into the periosteum, causes the irritability and recorded results.

General hæmatogenous bone diseases, in which the marrow is exclusively or principally affected, occur probably more frequently in equines than has hitherto been demonstrated. The importance of the marrow has only recently been acknowledged as a preparing organ. It is, therefore, not extraordinary that the genesis of Marrow diseases, and their relationship to the general health of horses, has not hitherto been cleared up.

Histologically, the marrow has a certain resemblance to the spleen. It is considered the most important manufactory of the red blood corpuscles, and is supposed to play a part in the formation of the white cells. The functions

* There is a good specimen of this appearance to be seen upon the facial bones of a rhinocerus in the Natural History Museum, South Kensington. Translator.

of the marrow have also been compared with those of the thymus gland in fœtal life.

From these considerations, it may be gathered that disease originating in the marrow must have an untoward influence upon the production of the blood and general nutrition of the animal.

On the other hand, the marrow, by its position and the arrangement of its vessels, is an integral part of the bone; therefore diseases, and particularly, inflammatory processes occurring in it, must influence more or less the appearance and movements of the horse, through the physiological behaviour of the bones. It will be understood that swellings and outgrowths in the marrow must cause pain, and if they remain long, cause the periosteum to stretch, and set up inflammatory processes in it.

The vulnerability of the marrow, when attacked by morbific material, is generally very great, as may be easily proved by sawing through the long round bones of horses which have succumbed to acute febrile infections or septic maladies. But it would be more difficult in the many maladies of the limbs, with which the above disease is combined, to diagnose during life what influence the affection of the marrow has upon the constitutional weakness and lassitude. Nevertheless, extensive experience has left me no room to doubt that in severe cases of Horse Distemper (Pferdestaupe) and Strangles the hæmatogenous irritation of the marrow has semiological importance. Typical Pneumonia or Pneumo-pleuritis appears to be less modified in its course by Osteomyelitic Affection.

In all septic infections, there is a strong hæmorrhagic infiltration of the marrow. Those acute febrile blood diseases, which produce a partial destruction of the red blood cells, and solution of the hæmoglobin, always lead to sanguineous swelling of the marrow and, most constantly, in the femur.

I have already explained elsewhere that the painful sensations in the limbs in Rheumatism and Hæmoglobinuria is due to affection of the marrow to a considerable extent. Very probably the marrow plays an important part in the symptomatology of many other cases of severe blood change, and the longer the maladies last, the more the general health of the patient will be influenced by the pain in the bones.

The blood in these maladies must, however, have the property of phlogistic substances, to support this theory, because simple extravasation and infiltration of normal blood into the marrow is as little painful as extravasation into the muscular tissue.

Besides the important role played by Osteomyelitis, as part of general acute febrile complaints in the horse, the diseases proper to the marrow are of no lesser scientific importance. The acute infections, Osteomyelitis and Periostitis in man, which are caused by Cocci (Staphylococcus pyogenes aurens, and Staphylococcus pyogenes albus) in the blood of the marrow or in the periosteum, more particularly in the femur or tibia, are not observed in horses or other domesticated animals. It is also an open question whether such chronic and incurable maladies of nutrition, such as Leukæmia, Pseudoleukæmia, and Essential or Pernicious Anæmia, may not originate in a constitutional affection of the marrow.

However close this assumption may resemble what has been proved to be the case in similar diseases in man, the actual demonstration of the essential changes in the marrow which occur in these chronic blood diseases in horses fails.

A chronic constitutional hypertrophy of the marrow, with disappearance of lime salts, combined with secondary Periostitis, has been noticed by a few Swiss and South German veterinarians.

This followed upon constant over-feeding with bran. Pütz, who, in common with others, has carefully investigated the disease and calls it "Red

Osteomalacia," says it resembles Osteoporosis, and that it is caused by the action of the acids upon the bony substance, but that the disease may be cured if an early change in the food is resorted to.

The symptoms are impaired appetite, stiff dragging gait, lameness, swelling of the bones of the head, and of the long round bones, particularly of the ends. Generally the bones of the skull and jaws bulge. If the food is not changed the horse succumbs, showing symptoms of progressive Cachexia. Zippelius (*Deutsche Zeitschrift f. Thierm.* 11, 1876) surmises that this disease is due primarily to the large quantity of phosphorus contained in bran. I will not discuss whether this is so or not; but in any case the disease must be, according to Pütz's exposition, a toxic hæmatogenous affection of the marrow. I have never met with a case in North Germany, in which horses have been fed for months and years upon quantities of bran with little else, and the disease is not reported from there. I do not hold that it has been proved that Pütz's Osteomalacia is identical with the chronic disease of the bones, called by Haubner, "Constitutional Osteoporosis," because the cases of the latter, which were treated by me and by others, were incurable, although the very best food was given, and the patients had never received bran, or very little. It is highly probable that there are many causes which give rise to Osteoporosis. The pathogenesis of the cases of constitutional Osteoporosis, which have been occasionally observed during the last thirty years, are altogether obscure. Haubner (Magaz., 1854), describes a case which lasted two years, and ended fatally from Marasmus. The symptoms were emaciation, bad digestion, loss of appetite, acid urine, bulging of the upper and lower jaw. *Post-mortem* revealed that many of the bones, particularly those of the head, shoulder-blades, and ribs were considerably puffed up (*aufgeblaht*), porous, and were sown with large and small periosteal bony new formations. Haubner says nothing as to any surmisable etiology of the case.

Gerlach described, in his lectures upon special Pathology, the case of a thoroughbred stallion, which died after an ailment which lasted two and a-half years. The patient, when led out of his stall, was as lively as others, but after moving a few hundred yards became incapable of any strong muscular effort. Gerlach considered that the disease was probably caused by continuous use of unsuitable drinking water. In the collections of veterinary schools there are several skeletons of horses which had been incurably attacked with Osteoporosis. Siedamgrotsky records a case in a badly-developed three-year-old. Phosphorus, and afterwards arsenic, were administered without result.

I have had opportunities of treating three cases of Osteoporosis, but without result. The horses were under the best possible stable management, both before and during the malady. There was nothing to be found in the food or water which could be accused as the cause of the malady. In these cases the disease began also with general disturbance; capricious and generally diminished appetite. There was loss of condition, and the temperament became less lively. Following on, a bulging of the bones of the face was noticed, which was greater upon one side than the other. In one patient, a six year old, the gait dragged, and there was at times lameness in one foreleg after the disease had lasted ten months.

Besides the progressive Cachexia and bulging of the upper jaw, there were periosteal thickenings upon the bones of the fore-arms, general anæmia, small pulse 45 to 70 per minute, temperature up to 39·5°. The urine was acid.

The owner allowed the animal to be destroyed, but would not allow the bones to be sawn, because he wanted to mount the skeleton. Notwithstanding all my endeavours, I have not yet had an opportunity of making a complete autopsy of a horse with general Osteoporosis. It is worthy of

remark that although the bones become lighter and porous, no case of fracture has been recorded.

Looking at the disease etiologically, it will be seen that it rarely occurs, as a rule, and that well-bred horses are generally the victims. The causes are as little known, as the fact can be explained, that notwithstanding the administration of the best food, and the use of therapeutic agents which appear suited to the disease, a cure has never been effected in any of the patients. Count von Lehndorff states, in his "Horse Breeder's Handbook," that when he was in the Royal Stud at Graditz, young horses from one to three years old sometimes showed, by bulging of the facial bones, stiffness of entire body, difficulty in rising, that they had diseased bones (Knocken-krank).

He used to adopt the following treatment with good results. He put them through a "hunger cure," upon the following diet:—

All oats were stopped as soon as the malady appeared. The patients were starved upon green lucerne, if in summer; if in winter, upon lucerne or red clover. Only enough was given to sustain life. Under this treatment an improvement was noticed in a few months. Then two measures of the following mixture might be added, viz., ⅔ white clover, and ⅓ soaked unhusked rice. When a complete cure was effected, the foals received the same diet for a year, but in greater quantities, with linseed cake. If the foals were not treated in this way, he says they invariably died in six months.

There is no doubt as to the correctness of this dietary. It might, therefore, be of use in treating older horses, if they were worth the expense.

It is very probable that simple and independent inflammatory processes, which in the higher stages of their development are capable of acquiring a chronic character, may arise in the marrow of single bones through specific poisons. Although this subject cannot be at present scientifically exhausted, I consider that it is desirable I should mention an observation, which seems to support the correctness of my surmise.

In July 1886, upon a farm in the East Haveland District, there were four horses; within eight days all of them were attacked with a peculiar disease of the locomotory apparatus; one mortally, two very severely, and one mildly. According to the owner and the veterinarian in charge, the horses ate their food regularly, and with appetite, throughout the attack, but when moved out of the stable they progressed with the hind limbs somewhat stretched out during the first minutes. No other disturbance in general health was apparent. If the animals lay down, they were unable to rise without a good deal of assistance.

Before I was called in consultation, a nine-year-old gelding, which had been lying helpless upon the ground for four days, died in consequence of its prone position, and of its unpreventable decubital struggles; but during this period it fed with a certain appetite. The autopsy I made two days after death showed the following appearances:—Most of the organs were altered by decomposition. The abdomen contained about twelve litres of bloody fluid, the mucous membrane of the stomach was swollen and reddened. Some parts of the mucous membrane of the intestine showed strong congestion of blood. The kidneys were softened from decomposition; the bladder contained a small quantity of thick urine; the spleen was infiltrated with blood; the liver slightly hypertrophied. In the thorax, nothing abnormal was noticed. The lungs were rich in blood; the pericardium contained a moderate quantity of bloody fluid; and the heart was relaxed and flabby. The mucous membrane of the gullet was swollen and reddened. I had the femur, tibia, humerus, radius, pelvis, and femur sawn open. In the superior epiphysis of the femur there was bloody infiltration of the marrow, such as is formed in many horses who have died of asphyxia.

There was also considerable injection of the vessels of the marrow of the femur and tibia. Of the fore limbs I could only find in the one humerus

inflammatory hyperæmia of the marrow. The ilium contained strongly reddened marrow. Nothing abnormal was noticed in the whirlbone.

A seven-year-old mare was attacked at the same time as this horse; four days later the third horse was unable to rise. The fourth, a powerful six-year-old gelding of strong constitution and troublesome temperament, after appearing rather weak in the quarters for two days, when led out, recovered after a change of food. I recommended a thorough and immediate change of the forage of the three horses. They received thenceforth only good oats, with a little chaff and faultless hay. They ate this with good appetite. The second and third horse had to be lifted up every morning, and sometimes oftener, by two or three men, whenever they lay down, for fully four months. They were unable to rise unassisted until December, 1886. During my examination in July, 1886, I failed to discover any important disturbance of general health. The horses stood in the stable and ate green food, hay, oats, with appetite.

Respiration 10·12, pulse 35·41, temperature 38·1°—38·4°; urine apparently normal, the mucous membranes unaltered. They could raise themselves in front, but not behind unless considerably assisted. If unassisted they fell back again, and made no further effort to get up. They were, however, worked in the fields. As the result of the autopsy, and my other investigation, I decided that the disease was caused by a specific intoxication. I therefore directed my attention to the food. The horses had received throughout the summer a moderate quantity of oats and chaff, with green food (red clover). Ten days before the outbreak the clover was replaced by green stuff, consisting of peas, vetches, and English rye-grass, which had been raised on well-manured land. As the green stuff grew very thickly, the horses received scarcely anything else. When the disease broke out the owner increased this green stuff, which appeared so excellent, in hopes that the malady would pass off.

I therefore concluded that some specific toxic substance had been taken into the system with the green stuff. Rye-grass is unimpeachable, but I hold that it is impossible that some morbific material may have been concealed in the luxuriously growing peas or vetches, although I am free to confess that that is hardly a sufficient explanation, in default of chemical analysis and experimental demonstration.

But it may be accepted temporarily. It is almost as difficult to find a pathological as an anatomical foundation for this malady. The behaviour of the horse when standing or moving showed that neither the spinal column nor its membranes were in fault. Neither can the muscles of the hind-quarter have been the subject of pathological change, for besides that, the mode of using the limbs showed nothing wrong in the muscles; the horses, in such a case, would have been unable to work if they had been unable to rise, in consequence of want of muscular power. Consequently it cannot be ascribed to paralysis. The peculiar phenomena must, therefore, be put down as caused by pain. But the joints were not attacked, otherwise there would have been lameness, and perhaps alteration of outline.

Therefore I came to this conclusion, that the horses were suffering from a painful inflammatory affection of the pelvic and femoral bones. The contemporaneous illness of all the horses showing similar symptoms causes it to be surmisable that the green food, administered for ten to seventeen days, contained a poisonous substance which had a specific action upon the marrow. If this be true, there is in horses a specific toxic inflammation of the marrow, the pelvis and femur being points most liable to attack.

In opening this address, I particularly stated that scientific investigation of hæmatogenous diseases of the osseous system is by no means exhausted. I need, therefore, hardly remark that it is not my intention to offer a solution for all the problems involved. Nevertheless, I consider it desirable to draw the attention of practical veterinary surgeons to the matter.

CONTAGIOUS PLEURO-PNEUMONIA IN CATTLE.*

BY PROFESSOR MCCALL, F.R.C.V.S., VETERINARY COLLEGE, GLASGOW.

GENTLEMEN,—A desire having been somewhat widely expressed that I should, at the annual gathering of the Veterinary Medical Societies of Scotland in Glasgow, contribute a short paper on Pleuro-pneumonia in cattle, its suppression by slaughter and inoculation, I have great pleasure in doing so.

Twenty-five years ago, if I had been asked by my professional brethren to contribute an article on the subject of "Pleuro" in cattle, I should have been expected to deal gently with the question of contagion; and if a census had been thereafter taken as to whether or not the disease was contagious, I would have been left (as I have been more than once) in the minority of those who believed in its contagion. It is no exaggeration to say that twenty-five years ago not over ten per cent. of the profession in these kingdoms believed that Pleuro-pneumonia was a contagious disease.

The late Professor Dick—clear-headed and far-seeing, as compared with most of his compeers—would never allow that it was contagious; so deep-rooted were his convictions, that in the year 1865, when the City of Glasgow applied to Parliament for powers to inspect public markets and slaughter-houses, and to erect public and abolish private slaughter-houses, I had the greatest difficulty, while making use of his valuable aid in carrying through these measures, in keeping him silent upon the point of contagion. His own words to me were:—"I agree with you in the benefit which will accrue to the public by the abolition of private slaughter-houses, and the inspection of public markets, but I will never admit that Pleuro-pneumonia is contagious."

Where now, gentlemen, are the veterinarians who doubt the contagiousness of the so-called Pleuro of cattle? They are not in this meeting, I am certain. We are, then, I take it, all agreed that it is a contagious disease, and spreads by contagion.

So far so good. But to what extent is it contagious? Here we shall differ. All must admit that the living and affected animal exhales in its breath the microbes of contagion, and that few sound animals can breathe the same atmosphere without contracting the malady. The sure way, the unfailing way, to spread the malady, is to introduce the affected animal among sound stock. Contact of bodies is not necessary; breathe the same atmosphere, and the malady is contracted.

Can Pleuro-pneumonia be spread in any other way than I have stated? Some say no; others, and many, say yes, and in various ways. My experience would lead me to say no; but I always act as if it had led me to say yes. In all my experience, I have never been able to trace an outbreak of Pleuro-pneumonia beyond a very limited area of the actually infected premises to "mediate" contact. How different to Foot-and-Mouth disease. I am conscious of having carried the contagium of Foot-and-Mouth disease to sound stock, twice to my own; but I have no such experience of Pleuro-pneumonia. The microbes, as far as I can trace, only escape from the infected animal in the breath and discharge from the lungs. They have as yet neither been found in the urine nor fæces as discharged by the animal. No doubt the microbes alight on our clothes, on the food the animals eat, on the bedding, on the fæcal matter. They are inhaled by us, and all creatures who enter the premises, as well as the cattle located therein, but apparently *they can only live and reproduce themselves in the lung tissue of the ox*. Even in the body of the ox, the microbes introduced

* A Paper read at the Annual Meeting of the Veterinary Societies of Scotland, on January 28th.

anywhere else than into the lungs, have a *very limited existence*. How different all this as contrasted with the vitality of the Anthrax microbes. These microbes, in my opinion, are scarcely ever propagated by atmospheric dispersion. They can only gain the body by water or food, and if inoculated at any point on the body of a warm-blooded animal, they reproduce themselves with great rapidity and prove deadly. Now, although such are the teachings of my experienee in regard to Pleuro-pneumonia, I do not act upon them. As a public servant it would be wrong to do so. I disinfect the litter and allow no dung to be removed until it has been disinfected to my satisfaction. I disinfect the hide of the affected animal when killed, and cause all affected parts to be disinfected and destroyed as if they were deadly vehicles of contamination. The byres, and all premises connected therewith, are subjected to rigid measures of disinfection; and, gentlemen, I have never known a second outbreak of Pleuro-pneumonia to take place in any byre I have had under my surveillance, that could lead to the supposition that it was in the most remote degree connected with the preceding outbreak. Too much, I think, has been made of the vehicles of contamination, and too little of the actually affected animals. The living virus, as exhaled in the breath of the living and affected animal in a limited area—*e.g.*, a cowshed—is almost certain to contaminate every head of oxen therein; but so soon as the animal dies, and the latent heat of the body has escaped, the contagium ceases to be given off, and cattle may breathe the atmosphere in close contact with the dead body, and even the diseased lungs. Supposing the one end of a funnel were fixed round the nose and mouth of an infected cow, and the other end round the nose and mouth of a sound one, I am certain that very few inhalations would be required to transplant the contagium from the diseased to the sound; but the dead body and diseased lungs, placed under similar circumstances, would fail in transmitting the contagium. Experimentally tested, what I have stated has been the results, and I attach great value to them, as I think they are strong arguments in support of our belief in the power to "stamp out" the disease. They also support the view that the vitality of the microbe is limited, and therefore great care is required in handling it, so as not to destroy its potency for inoculation purposes, when so required.

I shall now speak of the efficacy of dealing with this disease *by slaughtering of the affected animals*, and I shall only use in illustration thereof the measures which have been adopted in Glasgow under my own direction.

In the year 1867 I had the honour of being deputed by the Lord Provost and magistrates to inspect the whole of the cattle-sheds within the municipality of Glasgow, and to report upon their structure, condition, situation, and size, in order that licenses might be granted to the keepers of these sheds and dairies, in conformity with the provisions contained in the Cattle-sheds in Burghs (Scotland) Act, 1867. While engaged in collating material to make up that report, I also, at considerable trouble, put myself in communication with each individual dairyman, and collected from him all the information he could give me, regarding his losses by Lung Disease in his cattle. That information I tabulated, and it was printed and circulated at the time, and I believe was as near an approximation to the truth as possible under the circumstances. This tabulated statement showed that from 1854 to 1866, or for twelve years prior to making the investigation, the average pecuniary loss to the dairymen of Glasgow by "Pleuro" had been at the rate of £4,556 per annum.

On my report being completed, the dairies were licensed under new regulations. I am sorry to learn that some towns have as yet failed in making these regulations, and among the number the City of Edinburgh. In January, 1872, I issued a second tabulated statement, which showed that from August, 1869 (the commencement of the Contagious Diseases (Animals) Act) till

31st December, 1872, a period of three years and four months, the outbreaks had been reduced to thirty-two, and the annual pecuniary loss to £650 14s., or about one-seventh the sum which had been paid prior to the regulations having been issued. I have also just completed another tabulated statement dealing with the disease from August, 1873, to January of the present year, which shows that for the past thirteen and a half years the total fresh outbreaks of Pleuro have only been sixty-eight in number, the number of cattle slaughtered 728, and the compensation paid at the rate of £450 per annum, or one-tenth the sum lost by the dairymen of Glasgow prior to the passing of the Cattle-sheds in Burghs Act. We have no cases of Pleuro at the present time (we have only had two outbreaks for the past two years), and I am pleased to say, that while I have on many occasions directed the attention of various Local Authorities in Scotland to the fact of having received cattle affected with Pleuro in Glasgow from their district, I have received no such communications. I mention this because I know that Glasgow is frequently spoken of as a city in which "Pleuro" is seldom absent, when the reverse is the fact; and besides, all cattle affected with Pleuro and located in the byres thereof, go eventually to the slaughter-houses. It has also been stated that inoculation is practised in Glasgow; that is not the case. The Local Authority of Glasgow have been so thoroughly satisfied with the slaughtering of affected animals and the segregation of the remainder of the stock, that inoculation has not yet been adopted.

Treatment of Pleuro-pneumonia by Inoculation.

The treatment of specific diseases by inoculation of the virus of the specific disease, I need scarcely tell my audience, is a comparatively ancient remedy; and not only so, but the benefits to be derived from transmission and re-transmission of the inoculated virus through the bodies of similar and dissimilar species, has been recognised and fully appreciated. As examples, I may mention Variola—"Small-pox" in man, and its analogue in sheep, "Variola Ovina." Both of these diseases, as you are well aware, contracted by the natural method, are most deadly affections, scarcely an individual reaching maturity without being attacked by Small-pox. In a happy moment inoculation of the virus contained in the pock was had recourse to, and by this method of treatment the death-rate was greatly diminished, but still it continued to be the scourge of the human family. In a still more happy moment, for reasons known also to you, Jenner—the immortal Jenner—had recourse to what we term vaccination, viz., the inoculation of the virus contained in the pock on the mammæ of the cow, on the arm of the human subject, and by this means, and from that time to the present day, and, in all probability, to the end of time, if vaccination be continued, human Small-pox will remain a conquered foe to the human race. Small-pox contracted by the natural method, viz., by the inhalation of the virus, is a deadly disease. Small-pox contracted by artificial means, viz., by inoculation of the Small-pox virus, is much less deadly; and Small-pox contracted, either by the natural or artificial method, *after vaccination*, is a rare and comparatively benign disease. Now what relation does Small-pox virus hold to Cow-pox virus? Are they distinct or are they related? I consider that they are related, and not distinct. By experiment I have, as I believe, changed the malignant Small-pox virus into the benign Cow-pox virus; but I could not reverse the experiment, and change the benign Cow-pox into the malignant Small-pox.

Cultivations and transmissions of a virus, as a rule, in a pure atmosphere and with a fair amount of oxygen, weaken the virus, and in many well-known deadly diseases robs it of its virulence. If the virus of Small-pox and Cow-

pox be distinct, then you have established, *first*, that the virus of Cow-pox can destroy the virus of Small-pox, in its own soil, the human body—if the virus of Cow-pox be *first implanted*. Vaccination wards off Small-pox. *Second*, that the virus of Small-pox can vanquish the virus of Cow-pox in its own soil, the human body, if *first implanted*. Vaccination is of no use after Small-pox has been contracted by the natural or inoculated method. *Third*, that Small-pox virus, when inoculated in the cow, takes the same form as vaccine virus, as witness the vesicle or vesicles formed at the points of inoculation. Several other inferences might be drawn did time permit; suffice to say, that Small-pox, I believe, is a disease of the human family, and is only propagated from them. That the microbe or contagium, when introduced into the body of the cow by inoculation, is robbed of its virulence and contagium; and when retransmitted into the body of the human subject, as it is by vaccination, it so affects the blood and the living cells of the human body, that it has the power, for a given time, to resist the inroads of the same virus or living organism, when introduced in all its pristine vigour. I believe in a virus being weakened by inoculation and reinoculation and cultivations conducted in various ways, but I do not believe that one virus has the power to not only counteract the action, but change the form of the eruption into that of another, so that it becomes indistinguishable.

As I have already stated, there is much reason to believe that the contagium of Pleuro-pneumonia is only given off in the breath of the living animal, and that the organisms in which it is contained, or from which it is evolved, can only live and reproduce themselves in the air-cells of the lungs, and in close proximity to the lymph-streams. Micrococci, reputed to be the specific organisms of Pleuro-pneumonia, are found plentifully in the blood in the active stage of the malady, but it is more than questionable if *they* are the carriers of the infection, seeing that inoculations of the blood have failed in transmitting the disease—not so the inoculations of the amber-coloured exudate found in the cell tissue, and the salmon-coloured portions of the lung. When we inoculate, then, with this material, which we also find to be rich in micrococci, and provided it is not mixed with blood or pus corpuscles, and not kept a length of time, we are certain almost in every case to have a series of changes taking place at the point of inoculation, which, having run a definite course, disappear, and the animal afterwards is proof for an indefinite period of time to an attack of Pleuro-pneumonia by the natural method.

(*To be continued.*)

EXPERIMENTAL THERAPEUTICS.

BY FRED SMITH, M.R.C.V.S., ARMY VETERINARY SCHOOL, ALDERSHOT.

I HAVE long held the opinion that we use too many drugs in our practice, and that for all practical purposes the number might be considerably curtailed.

I should limit the number of drugs used to about a dozen, and in army practice to less than this. Let us learn the action of a few thoroughly, and not have, as is at present the case, a large number of medicines at our control, of which we positively know nothing regarding the effects on the horse. It is with a view of endeavouring to ascertain the action of some medicines on the system, that the following experiments have been made. Part of this paper has appeared in the *Quarterly Journal of Veterinary Science in India*, but the editor of the VETERINARY JOURNAL thinks that it will bear re-publication in this country, for which concession I am much obliged.

We have four methods of administering medicine:—1, by the alimentary canal; 2, by injection beneath the skin; 3, by injection into the trachea; 4,

by injection into the veins. Although the first method is the one in general use, we have no idea, or rather very little, of how medicines act when given this way. Take, for example, a dose of aloes; how does it act to produce purgation? 1, If given in a bolus, how long does it take to dissolve, and where does this occur? 2, If in solution, is it affected by the secretions of the stomach, or by those of the liver and small intestines? 3, Does absorption occur in the stomach or small intestines? 4, Is the action principally on the large intestines? 5, What is the action on the liver? 6, How does it act as a purgative? The questions relative to the disposal of this dose of aloes might be multiplied largely, but still these I have propounded will be sufficient to show my meaning, when I say we know nothing of the action of medicine on the horse.

The HYPODERMIC METHOD OF ADMINISTRATION we are all familiar with; it is a safe, speedy, elegant, and cheap mode of bringing the system under the influence of a drug. The only difficulty is in keeping the syringe and needles in working order, and obtaining the drugs in a state suitable for subcutaneous purposes. I have more than once completely vitiated my treatment by hypodermic injection, through using solutions made up by myself, which caused great irritation, abscess, and even sloughing of the part; this was caused by making them too acid.

With a subcutaneous injection, one of the objects is to have as small a bulk of fluid as possible, and, judging from experiments, the whole bulk of fluid should be in the general circulation in less than ten minutes.

Hypodermic solutions are made principally from the alkaloids of drugs. Such is the case with opium, belladonna, ergot, Calabar bean, etc.; the solutions must be neutral or very slightly alkaline. The introduction is effected by means of a graduated syringe and needle; many of the latter designed for veterinary practice are much too weak and flimsy; the needle should be stout, with a large bore, which is not liable to clog. A large needle is of course more painful than a smaller one, but the pain of the operation is so very trifling as not to be worth mentioning. In introducing the needle I pick up the skin, selecting a place where this is slack and thin, and push the needle boldly into the pinched up part. The thin and slack skin of the chest and neck is eminently suited for the purpose. If the needle is a weak one it cannot be made to penetrate the skin, and much annoyance results; in these cases the point of a lancet will overcome all the difficulties and clear the way for the needle.

The quantity of fluid injected must of course depend upon the strength of the solution, which cannot be too concentrated; a bulky fluid is most objectionable. The largest dose of any agent we may employ should be got into the compass of from one to two drachms. The larger the bulk the longer time it takes to inject, the more pain it gives, the longer time it takes to absorb, and it not unfrequently leads to unpleasant consequences, such as abscess and sloughing, owing to the dissection of the cellular tissue, which has occurred to make way for the fluid. The injection being completed the swollen part is gently manipulated, so as to favour the absorption and dispersion of the fluid, and in the course of a few minutes nothing should remain. On the other hand, if the fluid has caused irritation, in from twelve to twenty-four hours' time we find the place swollen, hot, very painful, and the result of this may be resolution, abscess, or slough. We have yet to learn the action of the alkaloids exhibited subcutaneously; my own experience does not agree with that of other practitioners, but we require herein, as in the other branches of the subject, careful experimental investigation to determine the various points.

INTRA-VENOUS INJECTION is one of the surest and swiftest methods of introducing a medicine into the system. It acts almost immediately, as the

drugs are at once placed into the very medium through which, or on which, they act. It is not, however, every medicine which can be injected into the circulation; in fact, the enormous advantage which this method possesses is, in some respects, quite counterbalanced by the fact that there are very few drugs which can be put direct into the veins, or are not best administered by other means. No drugs of an irritating or caustic nature can be introduced, none which coagulate albumen, and none which require for their safe entry into the system the channel of the digestive canal. I have practised somewhat largely the intra-venous method of administration, for I thought it to be the only sure method of getting an antiseptic agent into the blood in such diseases as Anthrax. I have introduced by the veins carbolic acid, iodine, perchloride of mercury, chloride of sodium, liquor ammoniæ fort., sulphate of copper, chloroform, veratrine, aconitia, etc.

The effect of introducing less than half a drachm of *Carbolic Acid* into the vein, is that in the course of a few seconds the animal becomes violently convulsed, perhaps falls backwards; he struggles violently, and remains like this for a few minutes; the attack gradually passes off, and the animal rises and looks none the worse for it. I never saw the least benefit derived from the introduction of carbolic acid into the blood in Anthrax.

Iodine is an agent which I used largely during one outbreak of Anthrax. I injected the tincture direct into the jugular. The effect was Phlebitis; I had, I think, better results after giving it by the stomach.

Perchloride of Mercury I tried by the intra-venous method in one or two cases. In the doses employed I could detect no therapeutic action. It ruined the needle of the hypodermic syringe. I regret that I have not to hand my notes of all the instances in which I employed these drugs, but the following cases are recorded in full:—

Liquor Ammoniæ Fort.: At 12.10 p.m. ʒiv. of the undiluted alkali were injected into the jugular vein of a mule, and were followed by another four drachms diluted with an equal quantity of water; later, as there was no apparent physiological action, ʒss more of the undiluted alkali was given. In forty minutes from the first injection he showed signs of colic, pawing, lying down, looking round to the sides, rolling, quivering of the muscles of the stifles and flanks, and stretching out, as in the position to urinate. The latter was by far the most remarkable and persistent symptom. At 1.30 p.m. he was lying down perfectly quiet, and remained so during the day; next morning he was quite well. I could detect no increase in the volume of the pulse, but the animal was extremely old. He was destroyed the following day, and I found Phlebitis of the jugular vein below the seat of injection, the vessel being filled with a firm blood-clot down to the chest, the muscles of the neck just at the puncture much discoloured. To an animal in the last stage of acute Anthrax, with an entire absence of pulse, I gave an intra-venous injection of liquor ammoniæ fort., about one ounce. He immediately lay down, then rolled over, struggled violently, but I got near enough to feel his pulse and it was perfectly surprising; is was full, firm, and quick, and this in an animal that was perfectly pulseless before the injection, but it did not save his life! Lauder Brunton says that ammonia stimulates the motor centres in the brain and spinal cord, the respiratory centre in the medulla oblongata, and the accelerating nerves of the heart. When injected into the veins it therefore causes convulsions like those of Strychnia, and quickening of the respiration and pulse.

Veratrine: I made a solution of Pulv. Veratrine ʒi, in ʒiiij of spirit, each drachm of this solution would therefore contain 1·875 grains of veratrine. I injected into the jugular vein of a mule forty minims of the solution at 12.35 p.m.; it caused an increase in the respirations and nothing more. At 12.50, injected eighty minims more; the respirations became very quick; in five

minutes more he was pawing, stretching out at full length, very restless, and I thought him dull; there was a copious discharge of viscid saliva from the mouth at 1.30 p.m., also distinct attempts at vomition; at 1.40, respiration very quick, expiratory effort strong; 1.45, lying down quietly and champing jaws, mouth full of saliva, suffering no pain. The pulse throughout was difficult to take, but it was so before the experiment began.

To another mule one ounce of the solution of veratrine was given by the jugular, equal to fifteen grains of veratrine; he almost immediately staggered and fell back; there was no struggling, the breathing was irregular, sometimes stopping; there were spasms of the throat and drawing in of the head; the mouth was white, and the eyeballs quite sensible to the touch long after breathing had ceased; there was no pulse. He died in five minutes. Autopsy revealed both lungs congested, right side of heart full of black fluid blood, left side enormously dilated with black coagulated blood, both auricle and ventricle could hold no more, and the clot extended into the aorta. The drug evidently produced paralysis of the heart.

Conia. A solution of ten grains to ʒj was used, and of this ʒj was injected into the jugular vein of a mule at 1.15 p.m. He fell backwards in a few seconds, there were spasms of the neck, respirations deep and quick, spasms of the throat, mouth blanched; the respirations now became very slow, sensation of eye perfect, no feeling anywhere else; no pulse; died at 1.20 p.m. Autopsy—No rigor mortis, both lungs congested. The right side of the heart was filled with black fluid blood, the left ventricle much contracted, with a firm clot extending into the aorta. The blood of the body was black and not coagulated.

Chloroform. I injected into the jugular vein of a mule ʒj of chloroform; the animal almost immediately fell backwards, sitting on its haunches, drawing its head into its chest, the ears laid back, pupils dilated, the mouth open, and looking for all the world like a mad animal; he then fell forward, lying on the side, champing his jaws, respirations increased, eyeballs rolling, no pulse, gnashing teeth, etc., all this time perfectly unconscious; at 1.23, the effects were passing off, he sat up on his chest and commenced eating dirt; 1·25, trying to rise, swaying from side to side; 1.30, rolled over; 1.33, got up and stood quiet. Was found to be perfectly blind, with dilated pupils; this was the result of the chloroform. Another mule received, at 1.47, ether ʒj into the jugular vein; at 1.55, another drachm; at 1.57, 80 minims; none of these produced any effect. At 1.59, 140 minims subcutaneously; at two o'clock the ether took slight effect, shown by a little staggering, but nothing more occurred, in spite of all the doses.

Sulphate of Copper. In the *Quarterly Journal of Veterinary Science*, Vol. III., p. 240, I recorded a case of Anthrax treated by means of large doses of sulphate of copper, which recovered after receiving an almost incredible quantity of the drug (12 ozs. of the salt in four days); I was anxious to determine whether this was due to the agent not being absorbed into the system, and accordingly made the following experiment: A solution of the salt was made and a quantity representing about ʒiij of $CuSO_4$ was introduced into the jugular vein. The patient at once exhibited signs of abdominal pain, which later on became more marked. The pain was acute and continuous, and it had to be kept under by large doses of Indian hemp. He died in twenty-four hours, and I found acute Enteritis, plugging of the jugular vein down to the root of the neck, heart was ecchymosed and flabby, its muscular structure pale. In this case the copper had an opportunity of selecting any organ of the body on which to act, and it selected the mucous membrane of the intestinal canal; this experiment proved that of all the copper I gave my Anthrax patient very little of it was absorbed into the blood, for we see that ʒiij of $CuSO_4$ in the blood will cause death.

To perform intra-venous injection requires some care; the vein should be filled by pressure below, and a sharp-pointed needle introduced; the depth must be judged, but it can be told when the cavity of the vein is reached by there being a feeling of no resistance to the point of the needle. Still in some cases it is difficult to determine, and where I have any doubt I slightly expose the vein and see my needle introduced into it in a downward direction.

I have tried the INTRA-TRACHEAL METHOD of administering medicine, but I must confess that I had always regarded the tracheal and bronchial mucous membranes sacred against anything but air, and was much surprised on hearing of Dr. Levi's method of tracheal injection which appears to be so eminently successful in his hands.

We will first of all review the experiments made by Colin on absorption from the air passages. This physiologist fixed a tube in the trachea of a horse and poured into it tepid water; six quarts were introduced slowly every hour; during this time the animal's flanks heaved very much, and the respirations were deep; at the end of three-and-a-half hours he was destroyed and the trachea and bronchi were found empty, the twenty-one quarts of water had been completely absorbed. When the introduced water is poured in rapidly, it produces disturbance of the respiration and changes in the blood, which soon cause death. Into the trachea of a very strong horse cold water was poured continuously, a bottle-full at a time. Up to the twenty-fourth bottle-full none escaped, the flanks heaved, respirations were from fifty-five to sixty per minute; at the fortieth bottle-full the animal began to stagger; at the forty-second he fell, allowing a large quantity of foamy reddish liquid to escape from the tracheal opening, nostrils, and mouth, and he died two minutes afterwards. The forty-two bottles-full represented about seventy-four pints. Autopsy revealed extensive pulmonary emphysema, slight œdema at the lower parts, and the bronchi contained a reddish foam but no free liquid. Other liquids, such as weak alcohol, ether, essence of turpentine, and vinegar disappeared very quickly from the air passages. Three-and-a-half pints of alcohol were injected into the trachea of a horse. Immediately the animal's flanks began to heave, he staggered, and fell down. Turpentine injected in small quantities by the trachea quickly gave to the urine the characteristic odour of violets. Fatty oils are not absorbed by the trachea and bronchi; they cause no disturbance of the respiration when injected; but are slowly rejected both by the nostrils and tracheal opening. Matter in solution and soluble salts are rapidly absorbed from the air passages. Into the trachea of a horse 186 grains of nux vomica in solution was injected, the animal was seized with convulsions, and fell when the last portion of the liquid reached the air passages; he died $5\frac{1}{2}$ minutes from the beginning of the injection. Into the trachea of another horse $1\frac{3}{4}$ oz. of a watery solution of ferro-cyanide of potassium was injected. The blood drawn from the jugular vein contained the salt the fourth minute after the operation.

The above experiments show us what wonderfully rapid powers of absorption are possessed by the respiratory mucous membrane.

As might *a priori* be expected, it is necessary that the medicines introduced into the trachea should be in the least irritating form. I presume the substance must be of nearly a neutral reaction, or, if otherwise, must be so diluted as not to produce irritation. My own experiments on the subject are as follows:—

At 2.40 p.m., I introduced into the trachea of a mule, by means of a syringe, ½oz. of chloroform; almost immediately he ran back, fell down, struggled violently, neighed, appeared to struggle for breath; the mouth was open, the eyes prominent, the respirations were very quick; he then became perfectly quiet, breathing heavily, and there was no pain felt on wounding him. After a few minutes ½ oz. Liq. Ammoniæ Fort. was put in the vein;

almost immediately he sat up and commenced to neigh; he arose, remained quiet, and half an hour afterwards walked perfectly to some short distance to be destroyed. Autopsy revealed the trachea full of frothy material much discoloured; the lungs were congested, particularly the anterior lobes; at their inferior part there was intense œdema, deep congestion of the vessels and lung structure; in fact, every appearance of acute congestive Pneumonia. The heart was flabby and contained a little fluid blood.

In another mule I injected, at 2.21 p.m., ʒij of chloroform into the trachea. At 2.23 he commenced to stagger, and fell forwards on his head; his respirations were very quick—he was lying on his side and had entire loss of sensation; at 2.30 he commenced to recover, and at 2.32 he got up. He was destroyed one hour afterwards, and I found just the same bronchial, tracheal, and pneumonic appearances as I did in the previous case. I repeated the experiment again with ether and chloroform, and produced, first, complete anæsthesia, and then pneumonia. I cannot say how this pneumonia would have been got rid of, or even whether it would have destroyed life, as the animals experimented upon were destroyed. I am also aware that I selected an agent which is particularly irritating, but I determined that absorption could readily take place in the manner described, and that perfect insensibility could be produced in a remarkably rapid manner. In the VETERINARY JOURNAL is published an article in which the author states that he has had great success in treating cases of "Husk" by means of intra-tracheal injections of turpentine.

The operation is remarkably simple:—Select a space between the rings about the centre of the trachea, and push the needle of the hypodermic syringe boldly in and inject the contents slowly.

Aconite.—I was first led to inquire into the value of aconite, as a therapeutic agent, by my fruitless attempts to destroy life by means of large doses. I gave to a certain horse first half-an-ounce, then three ounces, and next fourteen ounces of the tincture of aconite, in a period of nine hours, without producing any noticeable effect. The following day a fresh bottle of the tincture was opened, and one-and-a-half pints given undiluted, and as one dose. I observed no effect from this. Assuming the dose of tincture of aconite to be twenty minims, this animal received in twenty-four hours sufficient for 1,140 horses! It is hardly possible that all my bottles of aconite were bad.

Another horse received eight ounces of the tincture out of a bottle which had never been before opened; no result. A third received three ounces of the tincture out of a fresh bottle; it had no result. Perhaps the drug undergoes some change in the stomach, which renders it inert? To test this, one ounce of the tincture was injected into the jugular vein, with an entirely negative result.

These experiments were made in India, with an Indian prepared tincture. Either the tincture was bad, or else aconite has no effect on the horse. The alkaloid was used next to settle this important point.

Into the jugular vein of a horse, one quarter of a grain of the pure alkaloid was injected; no effect followed; later, two grains were introduced by the same method, with a negative result; last of all, five grains were injected, and this soon destroyed life.

A worn-out miserable pony resisted smaller doses of aconitia by the jugular, but was at last destroyed by one grain of the alkaloid.

Judging from the doses of aconitia given to man, a full dose for a horse would be four-fifths of a grain; yet, in the experiment related, the horse took two-and-a-half times more than the full dose without producing any symptoms of poisoning.

The Indian tincture of aconite is made undoubtedly from the *Aconitum ferox.*

This does not contain pure aconitia, or only in small quantities. This was probably the cause of the failure in my previous experiments.

I lately experimented with the English tincture, and gave a pony four ounces undiluted. In ten minutes there was slight frothing at the mouth, and a gulping sound in the throat, as if he were making repeated attempts to swallow; the pulse became weaker and very compressible, and, judging from the sound, the peristaltic action of the bowels was increased. In forty minutes more he commenced pawing with one fore leg, and one-and-three-quarter hours from receiving the dose, made most distinct attempts at vomition. These attempts at vomition and gulping noise in the throat were continued constantly for three-and-half hours after receiving the dose. He then commenced to recover, and at the end of five-and-half hours no symptoms of poisoning or therapeutic effect were visible.

In those cases where the animals were killed by the alkaloid, the chief symptoms were excess of salivary secretion, and violent tetanic convulsions.

I gather from my observations (1), that the tincture of aconite supplied in India is entirely devoid of therapeutic effect; (2), that aconite in *very large* doses may prove fatal; (3), that as usually administered, in twenty-drop doses, it can be of no use whatever; (4), it is very doubtful if it has the same therapeutic value on the horse that it has on man; it certainly has no effect on the skin, and but little on the pulse.

Opium.—This is a drug usually considered of great value. I have rarely known it allay pain, either in the form of morphia, the tincture, or the powder. I have only known it produce sleep twice, have known it produce violent delirium many times, and have had unpleasant consequences from its action on the bowels and kidneys.

The effect on the horse of a large dose of opium is to produce intense excitement, extreme nervousness, and delirium. The animal will walk round and round his box, always in one direction. The eyes are staring, the nostrils dilated, the muscles of the mouth are contracted; he stops and paws with one foreleg, he dozes, and perhaps rolls, rising again suddenly and resuming his monotonous journey; the pawing of the ground is usually a very marked symptom. I have known an animal (with a flooring of earth only to the box) dig a hole half a foot deep. At other times he will become destructive and eat away the woodwork of the box. This period of excitement will last ten or twelve hours, and is succeeded by the most profound depression, during which the animal stands with its head in one corner, roused, not from sleep, but from dulness, with difficulty, and remains like this for another eight or ten hours.

The length of time before opium takes effect is very great. I gave a horse half an ounce of the crude gum opium in a ball; he showed no effects from it for forty-eight hours. Six days afterwards I gave the same horse seven drachms of crude opium in a ball; he exhibited no sign of the drug for twenty-seven hours. Another horse received half an ounce of opium in a ball; eighteen hours afterwards it produced effect. I gave a horse at six p.m. Pulv. opii. ʒij in a ball; at 7.45 next morning I destroyed him. I found the ball in the stomach, the food lying near it was stained brown, only the end of the paper was broken, and ʒij of opium remained in the form in which it was given.

The hypodermic administration of morphia I practised for some years. The usual dose I administered was five grains. I have thought in some cases that relief from pain was experienced after a first injection, but that if it was necessary to give a second or third injection it was invariably followed by delirium.

The amount of morphia which a horse will stand is very considerable. In six hours I have given twenty-four grains of morphia, and have constantly

given eight grains as a single dose. The dose I usually start with is five grains. I feel bound to say that the stimulant action of morphia, and not its anodyne and soporific effect, is generally what I have seen produced. It has certain advantages over opium, inasmuch as it does not constipate the bowels or effect the secretion of urine, but as an anodyne I have but very little faith in it. A short time ago, I treated a case of strychnia poisoning in the dog by subcutaneous injections of morphia; the tetanic spasms did not stop until I had injected *eight grains of morphia* in the course of two hours; the dog slept for twenty-four hours and recovered.

The tincture of opium used so largely in our practice is, in my opinion, an utterly valueless drug as an anoydne. It is most useful in Diarrhœa, but for no other purpose of which I am aware. I have not prescribed an ounce of tincture of opium for over four years. The amount of this drug which a horse will take without producing effect is very great. I have given one pint of the tincture with no results, and lately I gave a pony ten ounces without any visible effect being produced. I am convinced that we do harm in our cases of Bowel disease by the amount of opium we prescribe as an anodyne. It has not the slightest anodynic effect, especially the tincture, and all it does is to increase our difficulties in overcoming the intestinal obstruction which is sure to follow on its use.

The various alkaloids found in opium have different effects on various animals. Birds are not poisoned by crude opium, and to kill them morphia must be given in enormous doses; it then produces convulsions. Narcotina kills birds, and has no action on man. Thebaia produces Tetanus, but on man has very little effect. It appears to me that the action of opium and its alkaloids on horses is much the same as it is on birds.

The effect of opium on the kidneys of the horse is most remarkable. In large doses it almost suspends their action, this being particularly noticeable in Diuresis, where the amount secreted will fall from several quarts daily to a pint or two. With careful administration, this should prove a most valuable drug in the treatment of cases of simple Diabetes. The action of opium on the bowels has been before alluded to; it is a most valuable agent in Diarrhœa.

As before stated, I have twice seen opium produce a soporific effect on horses. To an animal I gave ʒiv. of crude opium in a ball; for five days he remained dull and off feed, the bowels being constipated; on the sixth day he was very sleepy, and it was not until the ninth day that he quite recovered. To another horse I gave ʒiv. of opium; for the third, fourth, and fifth days he was off feed and very dull, and on the sixth day fed again. He then received ʒvij of opium in a ball; from the second to the fifth day he was dull, sometimes lying down and sleeping; the bowels were constipated; he recovered on the sixth day. These cases are very exceptional. The action of opium on the horse I believe to be a powerful stimulant and intoxicant to the nervous system; in very rare cases it is a soporific or anodyne.

Indian Hemp.—The Extractum Cannabis Indicæ is the only drug I have met with which acts as a powerful anodyne on the horse. I have used it for some years, and have never been disappointed with its action. I tried to destroy life with it, and gave a horse, after bleeding him to syncope, three ounces of the extract. The effect was most marked; he slept nearly all day with his head against the wall in a partially comatose condition; he recovered from the effects next day. It was this experiment which opened my eyes to its virtues. I have used it in Colic, Enteritis, Laminitis, and other painful affections, with excellent results. A great point in its favour is the rapidity with which it acts; if an ounce of the extract be loosely rolled up in paper and given it acts generally within half-an-hour, and the effects will not commence to pass off for three or four hours, during which time the patient will

stand with his head depressed, sleeping quietly, taking no notice of surrounding objects, and evidently enjoying a placid slumber. I know of no drug which is of greater value ; in painful diseases it acts like a charm. The dose usually recommended is one drachm. I never give less than one ounce, and in bad cases I have often prescribed two, three, or more ounces. In one case of acute Laminitis in all four feet, where disorganisation followed, the animal was in dreadful pain for a month ; life was prolonged (at the express wish of the owner) by subduing the pain with hemp. It was found that after a few days the dose had to be increased regularly to produce an anodynic effect, as the system became most tolerant of the drug, and I thought nothing of giving four ounces of the extract morning and evening. Indian hemp is a direct antagonistic to opium. I have repeatedly checked the delirium and intense excitement of opium by means of this agent. The effect is remarkable ; an animal will be going round and round his box, neighing, pawing, and excited in the extreme, and one ounce of the extract will render him dull, sleepy, and lethargic in about half-an-hour. In this condition he is insensible to pain ; he will allow pins to be put through the skin of the lips and other parts of the body without evincing the slightest sign of pain, and I have taken advantage of this anæsthetic effect to perform, under its influence, such painful operations as firing, without, I believe, producing pain.

It is said that the drug keeps badly and is unreliable. I have not found this to be the case, but am keeping some at present, to try its effects ultimately.

The objections to its use are that it is difficult to administer, is a most dirty and disagreeable drug to handle, has a most unpleasant smell, stains the hands, and is difficult to mix with anything else. I always give it as follows: Place in the pan of the scales a piece of paper, and run in the extract (it is nearly the consistence of treacle) ; cut off with a spatula, roll up the paper lightly ; cover with a little oil, and place on the back of the tongue as rapidly as possible.

Carbolic Acid.—I have used this agent internally in cases of Anthrax ; I have never seen any good effects result from it. The amount of this drug which a horse will take will rather surprise those who have no experience of its use. In Anthrax I always gave one ounce of the pure acid to start with, and one drachm every hour afterwards, as long as required. I have never seen the least toxic effect from this, and have given much larger doses. In the case of a horse which I suspected to be suffering from Anthrax, I gave eight ounces, two drachms of carbolic acid in sixty-seven hours. He recovered, but he had not the disease.

Iodine I have given internally for Anthrax. One case recovered, out of many treated ; he received half-an-ounce of pure Iodine in a ball every four hours. He would probably have recovered without the drug.

Intra-tracheal injections of Iodine were lauded by Levi as a cure for Glanders ; his views have been proved to be erroneous.

Cocaine.—Thirty minims of a 5 per cent. solution of this salt will produce local anasthesia when injected hypodermically. The loss of sensation is confined to the seat of injection, and a short way into the surrounding tissues. I have lately performed neurotomy in two cases when I produced local insensibility by means of this drug ; the results were most satisfactory.

Tartar Emetic has no action on the horse, and is non-poisonous, so far as my observations go.

In bringing these rather scattered observations to a close, I would remark on the length of time which elapses before medicine given in the form of a ball (especially if it be a hard one) dissolves, and are absorbed into the system. Practically, we know that it is the surest method of getting drugs into the stomach, but this is counterbalanced, in my opinion, by the length

of time which elapses before they operate, and in certain cases this may be a matter of considerable moment. I once gave a horse, receiving only twelve pounds of grass per diem, a Snider bullet, rolled up in paper; twenty-four hours afterwards the animal was destroyed, and the bullet was still in the stomach.

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ARMY VETERINARY ASSOCIATION.

(*Continued from page* 211.)

Mange is most troublesome and difficult to eradicate. As soon as you think you have cleared it out of one place, it breaks out in another.

Clipping is the first and most important measure, otherwise your applications do not touch the seat of the disease.

Query. How are you to clip a mob of half-broken mules?

Sheep dip is a most excellent dressing, and clipping machines should be in every chest.

If active operations are protracted, these diseases *will break out*, do what we may.

Cattle.—In our department I think we are apt to look down upon cattle, camels, and transport animals generally. At present I am referring, for want of space, to cattle only, and I say that to neglect them is an error. The bullock is the ordinary transport animal of South Africa, of India, and of many European countries.

In the Zulu War of 1879, and in the Boer War of 1881, the losses in transport oxen were enormous. In the Boer War the casualties amounted to eighty-five per cent., and I believe half were due to Contagious Pleuro-pneumonia.

In the Bechuanaland Field Force, when an outbreak of this disease occurred, the plan advocated by Veterinary Surgeon Rutherford was promptly carried out, under the supervision of the Veterinary Department, briefly, slaughter of all affected cattle, and careful inoculation of the remainder; the *result was most satisfactory*.

At the present time many people are asserting that Mr. Rutherford's plan is not successful; probably Veterinary Surgeon Berne would inform us of his opinion. It might astonish some home practitioners to hear that Mr. Berne inoculated about 2,000 oxen at Vryburg.

In his valuable book, Colonel Furse quotes tremendous losses amongst transport animals in the Afghan campaigns. In the first war, 26,700 camels died. Where these casualties occurred, all animals must have been in wretched condition.

At this meeting I may be permitted to express an opinion, that if our department, instead of being starved, had been stronger in numbers and judiciously administered, not only would these terrible losses have been very sensibly reduced, but there would have been a corresponding improvement in the condition of the others.

In connection with the diseases of cattle, I briefly relate the following, to demonstrate how careful we must be in all our transactions.

During the Boer War of 1881, a farm at Newcastle, near head quarters, was hired, for the purpose of turning out weakly and other animals to graze. After the war, the owner of the farm made a claim against Government for damages—about £10,000. He stated that we had introduced diseases on to his previously healthy land, that had swept off the whole of his cattle, rendering his farm useless for stock.

The matter was not settled until 1886, after an enormous amount of trouble; three (3) live generals were subpœnaed as witnesses, and one member of our department was called from India to give evidence.

Gunshot Wounds.—The animal system does not suffer in proportion to the human being from the shock of a bullet, and the subsequent nervous prostration. I have often seen horses, after being struck, commence to feed. Body wounds are the most serious, those of the extremities less so. A rifle bullet striking the large muscular tissue of the hind quarters produces a wound difficult to treat, for the reason that the bullet becomes embedded very deeply—too deep to extract, and causes a copious purulent discharge that runs down and excoriates the legs.

The wounds inflicted by bullets from modern rifles are very serious; owing to its twisting penetration the projectile takes a straighter course—is not easily deflected. The injuries to bones, when struck, are most serious; they are often split right up and smashed.

I believe it to be good practice not to attempt to extract a bullet until it can be felt with the finger. The resistance of the skin to the outward passage of a bullet is very great, you will often find the missile just bulging out the skin on the opposite side.

For the treatment of deep wounds good syringes are required, and several of them, or you may carry contagion all round.

Veterinary Surgeons.—I consider that invariably the numbers employed are not sufficient to enable the work to be done thoroughly; and, if the work be not thoroughly done, failure and blame stare us in the face. If you take into consideration the long lines of communication, the enormous number of animals required for an army, even when railways are in working order, the constant movement backwards and forwards, you will admit the necessity for the frequent inspection of all animals, with the view of detecting and of checking the outbreak and the spread of contagious diseases.

I wish also to bring to your notice the necessity for inter-communication amongst ourselves.

Example :—A convoy is passing through a station; the veterinary surgeon must not wait for an order to inspect, or they may be gone; he should at once make a careful examination. Should he find one affected with contagious disease, say Mange, that animal should of course be removed, and steps taken to prevent its spreading, The officer in charge of the convoy should be informed, and the next veterinary surgeon be communicated with, so that he may be prepared.

It is difficult to lay down a hard and fast line, careful judgment and decision are required. The officer commanding the convoy might say, "My orders are imperative to pass on—my ammunition or food is sorely wanted at the front; I cannot discard any animals." Do not shrug your shoulders and say, "I have warned you, I can do no more." You *can do more*; you can explain the contagious nature of the disease; you can point out that the harness should never be changed, that the animal should be kept from contact with others; you can provide suitable remedies; and you can warn the next veterinary surgeon on the line.

Be pliable and elastic, adapt yourselves to circumstances, and be ready with practical advice and assistance for all emergencies.

It is necessary to give the Inspecting Veterinary Surgeon early and complete information about an outbreak. By giving him this early information, you strengthen his hand; he has time to think the matter over and to give advice and help. When sent for by the General, he is prepared to state the case fully, to inform him what steps have been taken, and to explain the object of precautionary measures.

Another weighty matter is for the veterinary surgeon to make himself acquainted with the state of health of the animals in the surrounding country. Animal diseases always follow an army, and but little thought is required to appreciate the importance of this matter. In the Regulations you will find

that 250 animals is the charge laid down for the executive veterinary surgeon; on service you will often find these figures doubled, trebled, nay more than quadrupled.

The Inspecting Veterinary Surgeon.—That much-abused person, the Inspecting Veterinary Surgeon, has grave responsibilities in the field. The General looks to him for the efficient working of the Department, for keeping up the supply of veterinary medicines and stores, for efficient sanitation.

(The subject of veterinary sanitation has, I think, not hitherto received the attention it requires, as a means of keeping our animals in health and working condition. Sanitation in the field is of such importance that it would necessitate a special paper.)

He (the Inspecting Veterinary Surgeon) will often get the most vague information about projected movements. The Head-quarter Staff, as a rule, do not proclaim their intentions from the house-top; occasionally they know as little as any one else.

I do not agree with all the reserve medicines being at the base, as they cannot with certainty be obtained at the front when required. I hold that an efficient reserve should be at the front, in fact, in charge of the Inspecting Veterinary Surgeon, who should always keep veterinary surgeons on full equipment, so as to be prepared for unexpected sudden movements, and not require of them to make complicated requisitions on War Office forms. A simple form of receipt-book would probably meet all requirements. This would also apply to stationery.

To strengthen the position of the Inspecting Veterinary Surgeon, members of the department should keep him informed of what is going on in their charge. In his turn he can advise and help, and he can do away with unnecessary clerical work. A word of appreciation to a subordinate, in acknowledgment of hard work well done, is often gratefully received.

At all times the Inspecting Veterinary Surgeon should be ready to give the General Officer the percentage of deaths, the percentage of anima's on the sick list, and a sound opinion as to the condition of the animals of every regiment or battery in his charge.

He should exercise discretion as to the placing of men, so that the previous experience of each may be fully utilised for the public good. Some men are experts in the purchasing of horses and mules; others have considerable experience of cattle, camels, elephants.

The Inspecting Veterinary Surgeon should have decision of character, be able to grasp emergencies, to meet difficulties, be in touch with head-quarters, and in accord with subordinates, not be afraid of incurring responsibility, and should recognise that it is to the combined efforts of all that success is due.

The Expert.—I think it would be an advantage if what I may term an Expert were attached to the Principal Veterinary Surgeon, for the purpose of investigating diseases on the spot. He should be provided with a microscope and the necessary chemical appliances, and not be called upon to do ordinary duty. He could also assist in collecting statistics and scientific memoranda for the final report at the conclusion of the service.

The executive veterinary surgeon cannot afford the time for special investigations, nor can he possibly carry about the requisite appliances.

For instance, horses fed on barley and straw often contract a skin eruption; in fact, any change of diet may react on the skin. Now, suppose a few cases of Mange to have occurred, any change in the condition of the skin of other horses causes anxiety, which would be promptly relieved through the expert.

The example previously given of diseased mutton is illustrative of the advantage of the expert.

Conclusion.—I would suggest the veterinary surgeon be elastic and accommodating, that he be ready at all times to afford help, even on non-professional matters, to take his share of camp duties, should heavy fighting have reduced the number of combative officers available.

I again repeat the necessity for careful and systematic inspections to prevent contagious and infectious diseases. A grass-cutter's "tal" with Glanders will do as much harm as any horse.

These diseases, when established in an army, are most difficult to get rid of, owing to general insanitary conditions favouring their development and spread, and owing to the large numbers of animals packed together in camps for safety from the enemy.

Exposure to weather, insufficient or bad rations, hard work, tend to produce a state of affairs that will tax to the utmost our professional abilities.

Gentlemen, if we expect to be successful in future wars, we must carefully study the past, and take practical heed of all shortcomings.

The reading of Mr. Duck's paper was received with great applause.

Dr. FLEMING then rose and said that so many points had been dealt with that the paper would require a long time for discussion. Veterinary surgeons required a wide range of qualifications, they had a number of different species of animals to deal with, to diet, to treat, and many other difficulties to contend against which the medical man has not. The veterinary surgeon must be an expert, if the maintenance of efficiency and the prevention of accident and disease are to be our chief aims. The successful carrying out of this will tax the ability of the best men. The army veterinary surgeon has had to contend against great difficulties. His assistance and his power for doing good have been ignored, and grave losses have resulted. The Crimean and Afghanistan campaigns shows this in its most painful light. We must answer this ignorance by showing how valuable our services really are, and Mr. Duck's paper will greatly promote this object; the more our services are employed the more successful we will be. An expert, such as alluded to in the paper, would be a great boon to an army in the field. Every veterinary surgeon should be more or less of an expert, and I cannot impress too strongly on all veterinary surgeons the urgent necessity of making themselves scientific men; science is the higher development of practice. The enthusiasm and devotion of the veterinary surgeons of to-day are equal to that of the past, and their scientific attainments will place them on a higher footing. Respecting our organisation, we are better prepared now than we have ever been before; and the new farrier's scheme, which I hope will be promulgated on 1st April, will give us between 300 and 400 trained veterinary assistants in the field; shoemaking on service is to be done away with as being an impossibility; horses will be shod with machine-made shoes, which fairly intelligent men from the ranks can be taught to put on in three months and shoe a horse in half-an-hour; therefore one man can shoe 100 horses; thus the farriers are liberated from these duties for the purpose of hospital assistants. It is impossible to keep up during peace a staff of veterinary surgeons for two army corps. It has been decided, therefore, to have a reserve of veterinary surgeons in the country. 200 or 300 private practitioners would thus be available for field service. They would, during peace, have certain advantages, and wear the uniform of the department. Veterinary surgeons proceeding on active service will now have a servant provided them and their duties and position more clearly defined. I think it is highly essential that sick depôts and remount depôts should be separate. We cannot keep Glanders from an army in the field, and no disease is more harassing; in the Crimea we have shot sixty, seventy, or even eighty horses in a morning for this affection. Regarding treatment in the field, I believe that the hypodermic method of administration will be found more useful, and

a large supply may be carried in a small compass. Sore backs are the curse of mounted corps, and I believe that if the subject of saddle fitting was left more to the veterinary surgeon fewer cases would occur. I prefer the blanket to the numnah; the latter is liable to certain changes, and I think a good blanket will prevent bad backs.

The heaviest work for the veterinary surgeon will be on the lines of communication; for this duty the most experienced veterinary surgeon will be selected. Official returns on service are very necessary, but I am no lover of returns, and shall make them as few and as simple as possible. The question of forage is a difficult one. I was on a Committee at the War Office some years ago, and we decided to compress the hay and grain separately for very good reasons. It was found that it was impossible, by combining the two foods, to serve out a corn ration alone when troops were being temporarily despatched on duty. Respecting the purchase of horses, the services of a veterinary surgeon are extremely valuable, and I regard him as the best purchaser. Respecting the difficulty of obtaining shoes and nails, it will be arranged that in the future the issue of these will be in our own hands, the same as every thing else in our department should be. I cannot too strongly express my views with regard to the value of this school; upon it will develop the most important duties of lecturing to veterinary surgeons and the training of farriers and shoeing smiths as veterinary assistants in the field; this latter is calculated to obtain for us a subordinate veterinary staff, not on our hands during peace time. The Army Veterinary School deserves our best wishes for the work it has done, and that which it will do in the future. In conclusion, I beg to thank Mr. Duck for the extremely valuable and interesting paper which he has brought before this society; he has introduced points which meet us on all sides on service, and we will do well to profit by the experience of so able a writer; personally I am indebted to Mr. Duck for much information.

Mr. WALTERS dwelt upon the necessity of the executive staff keeping the administrative officer fully informed on all points, so that the latter may be able to furnish the War Office with that information which they look to him for; in order that this may be thoroughly carried out, returns are essential. The base hospital established by me in the Soudan worked well; nothing could have been better than the way in which my executive officers carried out their duties. Some difficulty was experienced in obtaining a subordinate staff, but our future organisation will give us more power. In my opinion, the Sick Horse Depôt should be in charge of a veterinary surgeon.

Mr. THOMSON dwelt upon the necessity of a permanent staff for sick depôts, and some regular method for admitting horses to treatment, being adopted. He gave, as an example, what occurred in Egypt, when horses were brought from all corps and left in the infirmary for treatment, nobody having any knowledge as to whom they belonged.

So many points required careful consideration, that the further discussion of the paper was deferred until the 2nd February.

Before the separation of the meeting, it was proposed by the PRINCIPAL VETERINARY SURGEON that the Association should be an army one, and known as the Army Veterinary Association, all officers of the Department to be invited to join.

The views of Dr. Fleming were gladly accepted.

Tea was laid in the Museum of the Army Veterinary Schools, and a pleasant and instructive evening was spent.

The preliminaries connected with the formation of an Army Veterinary

Association were discussed at the next meeting, which was held on the 2nd February.

It was resolved to write to every officer of the Department and ask him to join, the entrance donation to be ten shillings, and nothing else charged unless they served in Aldershot, when a small monthly subscription of one shilling and sixpence was necessary for covering the cost of periodicals, etc.

It was proposed and carried, that the Principal Veterinary Surgeon to the Army be made Permanent Honorary President, that the Inspecting Veterinary Surgeons be made Honorary Vice-Presidents, and that the Chairman for each meeting be elected from among the members present.

The professional business of the meeting was the discussion of the various subjects in the paper read by Veterinary Surgeon Duck.

The following members were present:—Inspecting Veterinary Surgeon Walters, Veterinary Surgeons Duck, R. Poyser, J. C. Berne, F. Smith, O.S., W. R. Hagger, F. Raymond, Caldecott, R. W. Raymond, F. W. Sharpe.

Inspecting Veterinary Surgeon WALTERS in the chair.

It was suggested that each subject of Mr. Duck's paper should be discussed separately.

The first subject had reference to the formation of a Remount Depôt, etc.

The CHAIRMAN, in opening the discussion, said that the Remount Depôt and the Sick Horse Depôt should be distinct, and gave as example a description of the formation of the Remount Depôt in Egypt; he disapproved of the present system of combined depôts. The books recommended by Veterinary Surgeon Duck, he considered, were rather too complicated, and advised the formation of a field book, one for Remount and one for Sick Horse Depôt, made in the shape of a cheque-book, so that a sheet could be sent with the animal and the counterfoil retained. He thought the difficulty of veterinary surgeons dealing with men could be provided for by having a quarter-master attached to the depôt, the men being handed over to him for discipline. Would recommend two per cent. of trained assistants as a permanent staff. He was of opinion that the greatest number of serious cases seen on service were landed from ships, and it was therefore necessary to have a large hospital at the base, that all animals might be attended to before going to the front.

Mr. BERNE thought that farriers and shoeing-smiths ought to be noncombatants.

The meeting considered that a certain percentage of trained assistants should be kept as a permanent staff at the Permanent Sick Depôt.

Picketting.

Mr. POYSER said he was in favour of independent picketting; he described a peg carried by the Indian Native Cavalry, which had a groove down one side which gave good hold in the ground, and a ring through the top of the peg for attachment of the rope.

Mr. DUCK recommended line picketting, without heel ropes; or for small parties, ring picketting, and said that when this was used he never knew the horses to move far.

Mr. WALTERS said the picket-peg could not be used in a sandy desert, such as Egypt; there being no hold in such places, it was usual to fill a sack with sand, and then bury it.

There was a short discussion on the various ways of carrying the peg.

Grooming—Is Grooming Necessary in the Field?

Mr. WALTERS thought that too much grooming on the picket-line was a mistake, and that one brushing a day was enough.

Mr. POYSER thinks grooming is most necessary, and suggests a small blanket as a protection instead of an accumulation of dirt, which has hitherto been considered necesssary. He would like to see as much of the mane and tail done away with as possible on service.

Mr. DUCK agreed with Mr. Walters that one grooming a day was sufficient in the field, and that should be done with the brush.

After a short discussion on this point, it was considered by the meeting that one good grooming a day was quite sufficient on service.

Saddles, Numnahs, Blankets.

Mr. SMITH called attention to the great evil of the saddle resting on the blade bones of the horse, and said that stumbling was due to the pressure on these bones. A discussion, in which all present took part, followed, on the various military saddles used, the value of the blanket, the prevention of sore backs, and the best method of fixing back the girth in obstinate girth-galling.

Medicine Chests.

Mr. WALTERS suggested that a field chest made of wicker-work, and covered with hide, of a size somewhat between the usual medicine chest and the field wallet, should be substituted for the cumbersome one at present in use; it should be fitted with good-sized bottles.

In answer to the question what medicines should be sent out, Mr. WALTERS said that simple drugs only should be sent; at present much was packed in the chest that was never required. He suggested plenty of petroleum as being very valuable.

Mr. SMITH thought that liquids could be dispensed with, and all that was required could be carried in solid form.

Mr. DUCK was of opinion that veterinary stores as well as medicines should be supplied by the Department, and that some simple form of requisition should be instituted. He dwelt upon the value of wood wool as an absorbent and antiseptic dressing, and recommended that plenty should be carried.

As to the inspection of slaughtered cattle, it was considered that all should be inspected by a veterinary surgeon in the field.

FRED SMITH, Hon. Secretary.

CENTRAL VETERINARY MEDICAL SOCIETY.

(*Continued from page* 196.)

Plantar neurotomy may be practised in two places, at the upper part of the pastern, or behind the coronet. To expose the nerve on the pastern, feel for the dip below the sessamoid bone; next carefully trace the anterior margin of the perforatus tendon where it seems to join the dip, and along this margin, just in front of it, make an inch incision. This exposes not only the main trunk, but also the median branch which it gives off, so that either one or both may here be excised. If we operate on the back of the coronet, we divide the main trunk which runs into the foot. This is rather difficult to expose, and by no means without danger. Select a spot half an inch above the lateral cartilages; trace carefully the insertion of the perforatus, making certain of the spot by ascertaining if the perforans can be felt where it comes between its two branches; next, select the posterior border of the insertion of the perforatus tendon, and cut down on it just in front of this border, cutting in a direction upwards towards the anterior part of the tendon itself (not its insertion). This will expose the nerve which is *very closely connected*

with the artery, the latter in front of it; above, but too high to be interfered with, is the ligament of the pad. If preferred, and it is certainly more convenient, the incision may be made from above downwards, in which case it is only the previous direction reversed; feel for the anterior border of the perforatus tendon just above its insertion and carry the incision downwards towards the posterior border of the insertion branch. I think the first direction I gave is the safest.

Neurectomy may be high or low; that is, we may excise the metacarpal nerves above the fetlock, or the plantar nerves below it.

The high and low operations have each their supporters and opposers; the French, I believe, are very partial to the low operation, I hardly know the feeling of English practitioners on the subject, but I think they take the following rule as a guide: if the cartilages and coronet are affected perform the low operation, if the navicular bursa is diseased perform the high operation. A great many failures in neurectomy are supposed to be due to the fact of the low operation being adopted; formerly, I seldom performed it, but I can offer no good reason why I did not. It is said to be unreliable and for the following reason—suppose a case of incurable Ringbone; the anterior, lateral, and posterior parts of the coronet are supplied by different branches of nerve, as we have previously shewn; it may so happen that we divide the branch leading to the painful place, but the chances are that we will not, for we have no method of determining at which portion of the affected coronet the pain is felt most; if the whole coronet be affected, then nothing but total division of all branches can be of the least use. Again, the recurrent branches of nerve will act to the detriment of the low operation, for although we may excise a trunk leading to the affected spot, yet sensation is carried on by a branch this divided nerve has received from another below the seat of operation. I think that for Navicular disease the low operation will prove the best, and I purpose giving it a greater trial. I have been very pleased with it in my late operations.

My views on the relative advantages of the high and low operation stand thus. In a very large number of cases I have performed the high operation, and I have only met with one mishap. After this occurred I examined more closely the question of total or partial deprivation of sensation to the foot. I believe high neurectomy is a mistake when the low operation will suit, and I think that for Navicular disease the latter should be the first one tried. In civil life this might be objected to, on account of uncertainty in the removal of lameness, but no such objection can be urged against its trial in military surgery. I have patients working now, suffering from Navicular disease, some of which have had the high, others the low operation performed. Both are standing equally well, and I cannot help in my own mind regretting that I have not performed the low operation more frequently, for it is obvious that if we can retain sensation in the fetlock, the front of the pastern, and probably in a small portion of the foot, it is a distinct advantage lost to us if the high operation be performed. It is said that Sloughing of the foot is more common after high than low neurectomy. I am not prepared to say whether or not this is correct; we have no statistics to guide us as to the frequency of Sloughing after the operation. I have had it occur to me once, and only in one foot, though both legs were operated on.

It occasionally happens that neurectomy need not be double, in other words, it need only be performed on one side of the limb; of course this is an advantage.

The question may be asked, why, in operating above the fetlock, divide the main trunk of nerve so high up the leg? Why not divide it immediately above the joint and so destroy less sensation? There are two explanations. (1.) It is much safer and much easier to isolate the nerve higher up. (2.)

The divided extremity of the nerve becomes enlarged, and if the trunk were excised on the fetlock it would be greatly exposed to injury from the opposite limb, and the pain of striking the bulbous end would be sufficient to bring the animal on his knees, particularly if, from previous injury, the nerve was congested.

OPERATION.—I seldom perform this operation, excepting the patient is under chloroform. I look upon it as the most painful we are called upon to inflict, and although the intense suffering is but momentary, yet we have no right to cause pain, if it is in our power to render the animal insensible to its presence. Let us endeavour to estimate what the suffering is, and our best comparison is the extraction of a tooth. A large human molar is supplied by four nerves, about the thickness of a piece of fine sewing cotton; rupture of these in the process of extraction makes the strongest of us quiver. The metacarpal nerve of the horse is quite one-eighth of an inch wider, and equal to at least a hundred pieces of sewing cotton in thickness, so that division of it is about equal to the simultaneous extraction of twenty-five large four-fanged molars! If we perform neurectomy on both fore legs, it is equal to the extraction of one hundred teeth! This is only a calculation of the agony caused by the division; it does not take into account that produced by pinching the nerve with forceps occasionally to see whether we have got hold of the right structure, or the accidental touches it receives in clearing it and passing the needle under. We have no right to inflict this suffering, if an anæsthetic is available.

Lately, I have produced local anæsthesia by the subcutaneous injection of a four per cent. solution of cocaine. Twenty-five minims is ample for the purpose, and in the few cases I tried it on, the operation was quite painless.

Before leading my patient on to the operating bed I invariably have him trotted, not only to see how he is going, but, if one limb only is being operated on, to make quite certain of the leg. This precaution seems almost unnecessary, but it is quite possible, when an animal is down and ready for operation, to be *uncertain* which limb is affected. I once saw a horse unnerved in the wrong leg by a very careful practitioner, who took it for granted that in his absence his assistant had cast the horse on the proper side, and he operated on the upper leg accordingly, which was the wrong one.

The patient having been cast, I proceed to apply an elastic bandage to the coronet and pastern, and wind it tightly on the leg up to the knee. Above this is placed a tourniquet (a piece of India-rubber, which is pulled tight and knotted); the blood supply is now cut off, and the limb completely anæmic. This is the so-called bloodless method, introduced into human surgery by Esmarch, and first applied, I believe, by me in veterinary surgery nine years ago. It does not require the exact apparatus I have described; a stout linen bandage and a strong arm will take the place of the elastic bandage; and some narrow rope and an office ruler will supersede the elastic tourniquet. Personal ingenuity will supply everything, and what a treat it is to work on a limb in this state! No sign of blood, no staining, the tissues deadly white, the nerve well marked, and as easily removed as it is from the limb of a subject on the dissecting-room table. If a mistake is made it can be rectified, and no one is any the wiser; should a branch of artery be wounded, it can be ligatured without the loss of a speck of blood, and no staining of the part to interfere with our further progress. The bloodless method has everything to recommend it, and no single objection, excepting the *trouble* of applying it, which is trivial, and occupies less than a minute.

High operation.—The hair having been previously clipped closely, and the part thoroughly washed and disinfected with carbolic solution, the operator, with his few instruments on a small tray, held on his right hand side by an assistant, puts his left hand under the limb with the thumb uppermost,

and with it (the landmarks having been observed) feels for the nerve (it can be readily felt in the artificial anæmic limb of a well-bred horse). Having satisfied himself of the proper position and keeping his eyes intently fixed on the place, he makes an incision an inch in length through the skin; the forceps are now taken, and an assistant's hand under the limb draws the skin tight and so opens the wound—it must be drawn equally tight on both sides, or else the parts will be disarranged; in the absence of a skilled assistant, the stretching open of the wound would be perhaps best avoided. The next step is, with the knife and forceps, clean the nerve of cellular tissue, and if it can be now seen, make certain of it by passing the needle and silk underneath it, and leaving the latter loose under the nerve. The cleaning may now be completed, and the nerve gently raised from its bed by the ligature, and its connective tissue divided. A probe-pointed bistoury is now passed underneath flatways, and the edge being turned upwards the nerve is divided with a slight stroke; the forceps next seize the inferior divided portion, and if sufficiently clear of tissue, it may be pulled outwards, and a good inch cut off. A suture of carbolised silk is passed through the wound, and knotted together at the end, but not drawn tight; the leg is covered with a towel, and the patient turned. The wound being now lowermost and resting on the bedding, no dust or dirt can get in, because the towel is between the wound and the litter. The towel is now opened, and the internal aspect of the limb is exposed. This is the most difficult operation, for the nerve lies deep in the hollow of the limb; this may be corrected greatly by the fingers of the left hand being used on the outside of the leg to press it up; feel for the nerve with the thumb, using the landmarks before mentioned, and cut down on it in just the same way as above stated.

The points to be observed in the operation are that, once through the skin, don't put the point of the knife in too deep in clearing away the cellular tissue, for in some animals the sesamoid sheath is dropsical, and may very readily be snipped up in the forceps and a piece cut off it, when the synovia flows out. I have had this happen to me two or three times; fortunately, as I always adopt antiseptic precautions, no evil has ever come of it; but still it is an unpleasant complication.

Another point is, never hurry; operating against time is unscientific, and may cause an accident. Sometimes the nerve does not appear as conveniently as we think it ought to; this need not create alarm; it cannot be very far away.* So, just clear out a little more connective tissue, and use the needle to where it should be, and see if it can be hooked up; but in using the needle it must not be put in too deep. If on the needle you find a white, slightly glistening substance, with well-marked borders, clean it and divide it—you may be certain it is the nerve; if it is a yellowish-white body, with a roundish, cord-like feel, remove it from your needle, and let it drop back—it is the artery; if another yellowish-white substance, with a thin feel, don't interfere with it—it's the vein. My rule is to *regard with suspicion anything thicker than the nerve should be.*

I have had very great experience in this operation, and it is surprising how difficult it is, if the cellular tissue exists in any amount, either from "gummy legs" or other causes, to get hold of the right thing. I have taken out a thickened piece of cellular tissue for the nerve, and I have on other occasions divided the artery and vein; but this can only happen in very bad legs for the operation. Still it will occur—the best surgeons have met with acci-

* Last month I was operating on a case; I excised the external nerve readily; the internal nerve I could not find, although I made two different incisions for it. I had at last to let the patient get up. Next day he was cast again, the low operation this time performed, and after a little difficulty the nerve was found. It was half an inch out of its course, and anterior instead of posterior to the plantar artery.

dents, and I hope the details I have given will not be considered prolix, for I am sure attention to them will be found of use to those who only perform the operation at long intervals. I make it a rule to examine the piece of tissue I remove; a glance will then tell whether it is the nerve; should, by any accident, a vessel be cut, it can be told as soon as divided.

Low operation.—The same precautions in cleansing the part are observed; the leg being removed from the hobble, and the landmarks *most carefully* determined, the usual incision is made as before directed. Remember the artery and nerve are in close apposition, and to excise the latter it must be very carefully dissected away from the former. The only danger in the low operation is of wounding the artery; but if attention be paid to the foregoing directions, this is not likely to occur.

The operation completed, and the sutures in the wound, but not tied, undo the tourniquet, and whatever slight hæmorrhage may follow this endeavour to stop with cold water; sponge the wound, but on no account attempt to close it by drawing the sutures tight until every drop of blood has ceased to flow, and until the smallest clot is removed from the wound, and the stained tissues disinfected by the application of a little carbolic lotion. When everything is ready—and this may take half a day—close the wounds by gently tightening the sutures, adapting the edges evenly, place on a piece of lint soaked in carbolised glycerine, and retain it in its place with a bandage, and then the wound is placed in the most favourable condition to heal by the first intention.

The accidents likely to occur during the performance of this operation are three: the division of the artery, of the vein, and the opening of the sesamoid synovial bursa. The first two could hardly occur (speaking of the high operation) on the outside of the limb, but the latter may occur on either side. With the low operation there is no bursa to open, but the artery may be divided.

If the thickness of the metacarpal and plantar nerves be known, anything larger than these on the needle must be regarded with great suspicion, and an attempt made to analyze their composition. If the structure we raise is very large, we may be certain that the artery or vein is included with it. Should it, by misapprehension, be divided, a glance at the divided part will tell us whether it is the artery or the vein; if the former, raise the divided vessel with the artery forceps (the wound may have to be enlarged, as the artery retracts when divided) and secure with ligature *both ends* of it; if the vein be divided, only the distal end of the vessel need be tied.

After the vessel has been tied, complete the operation and close the wound in the usual manner, and if silk has been used for ligature, leave the ends hanging out. Should the artery have been tied, favour the collateral circulation by immersing the foot and pastern in water at blood heat, and at night put warm tow and a flannel bandage to the coronet and pastern, to keep up the temperature; in two days this may be discontinued. Dividing the artery in the high operation is rather serious, for it is the main branch, and not the plantars, which is cut. I once divided it completely, and ligatured the cardiac end, and though the main vessel was tied, yet collateral circulation became perfectly established. If the artery in the low operation be cut, it need create no alarm, for it is only a branch of the main vessel, and is easily replaced.

If the bloodless method be adopted, no fear need be entertained about dividing the vessels, as they are rapidly secured, and no one is the wiser. But if the blood is in the limb, it's a great tell-tale; a jet from a metacarpal artery or vein is a very large stream, and looks bad; besides, there is great difficulty in securing the vessels, as the jet is blinding. If this accident happened in a non-bloodless operation, I would recommend emptying the

limb with a bandage, and applying a tourniquet to the arm, then searching for the wounded vessel and securing it.

Opening the synovial bursa is not a difficult matter, particularly if it be dropsical; the nerve lies close to its surface, and once through the skin, the knife and needle cannot be used too cautiously. I have opened the bursa three or four times; the synovia ran out, but I never had the least unpleasantness from this accident, nor did I retard recovery; I attribute this to antiseptic precautions.

After the operation I keep my patient on low diet for two or three days, the wounds being dressed morning and evening. If there is no local swelling or tenderness, everything is going on well, and the sutures may be removed in safety on the fourth or fifth day, when the wounds will be found healed by the first intention. Such results are, of course, most satisfactory, and I confess to a feeling of pride in delivering over to the owner within a week or so of the operation, his animal sound, wounds healed, and horse fit for work. Healing by the first intention is only obtained when the most scrupulous cleanliness has been observed. A farrier's dirty fingers touching the wound, when being dressed, will frustrate this attempt.

With every care and precaution we can exercise in veterinary surgery, by far the majority of operation wounds will suppurate. Those strict antiseptic precautions, so readily carried out by the human surgeon, are not practicable with us. Dust from the operating bed, litter, &c., will alight on the wounds and so produce suppuration in spite of all our care and attention; still, I have had many neurectomy wounds heal by the first intention, but very many more that have not. On the first or second day after the operation, the parts are swollen, hot, and painful, and the swelling may go up as high as the knee and arm. To leave the sutures in now, would be to create further mischief: the part is suppurating, and drainage must be established. Remove the sutures carefully; a thin serous or sero-sanguineous pus will escape; disinfect the wound with a solution of carbolic acid poured in gently with a syringe, and use carbolized bran dressings. These may be changed twice daily if necessary, and the process of granulation will close up the wound in a fortnight or three weeks. Once, and only once, of the many neurectomy wounds I have treated, have I had any serious trouble with them. This animal on the third day suffered from acute Cellulitis of one limb (both were operated upon) which terminated in extensive Sloughing of the surrounding skin; it extended over the metacarpal bone, and denuded a space four inches by two. The process of healing was very slow, and the animal was under treatment for some weeks and was eventually left with a very extensive blemish. I was entirely at a loss to account for this, as I had exercised every care, and I attribute it to deprivation of nervous influence. The opposite limb was never affected, and if I remember properly, the wounds healed by the first intention. This and all other cutting operations require absolute cleanliness, surgical cleanliness, disinfection of instruments, hands, towels, sponges, and everything brought in contact with the wound. I have used the spray, but it is quite unnecessary.

The *Sequelæ* of the operation may be non-removal of the lameness, recurrence of the lameness, Sloughing of the foot, tumour of the cut end of the nerve, and Gelatinous degeneration of the phalanges.

Non-removal of lameness.—I have sometimes been disappointed, in seeing my patient out a few days after the operation, to find him still lame, often as bad, sometimes worse than he was before it. There are few things more annoying than this, but the case is seldom as bad as it appears; the only thing to trouble one is whether the nerve is properly excised, or whether a small portion of it has been left behind. This is easily determined by pricking the coronet with a pin. If the high operation has been performed there

should of course be no sensation when pricked; if, however, only a filament of nerve be left intact, the foot is very suddenly lifted on the application of a pin to the coronet or pastern. Should this examination prove negative, the wound should be carefully pressed, when perhaps a painful point may be found, caused by some irritation to the cut end of the nerve. I believe many of these cases of lameness are produced by portions of nerve getting fixed in the wound during the process of granulation or adhesion, and that trotting exercises a certain amount of traction on it, and so causes pain; however this may be, I give these cases a good smart gallop with the object of liberating this fibril of nerve from the wound, and I have on many occasions been very gratified by finding my patient after this procedure trot sound and remain so.

Percivall, observing this non-restoration to soundness, remarks that it may be due to the animal being cramped with the hobbles, or the wounds sore, or going lame from habit. Regarding the latter cause, it is really not improbable that the animal may have been lame for so long that he does not know how to go sound, and the gallop I recommend may have the effect of restoring confidence.

Lastly, the lameness may be kept up owing to recurrent fibres; this could only happen in the low operation where the superior median and main trunk of plantar nerve intercommunicate so freely. If this should be the case the high operation had better be performed.

Recurrence of the lameness is a great nuisance, and is due to an insufficient excision of the nerve. I have known a patient return to me lame within a year of removing half an inch of his plantar nerve; in this case regeneration was very rapid. This phenomenon of nerve-regeneration has excited the interest of histologists, and much has been written about it.

Mr. Sewell found that nerves simply divided in the horse re-united in about two months. In some animals there appears to be a special proneness to nerve regeneration, for one patient that came under my care I unnerved three times in two years, on each occasion removing a good portion of nerve. In re-operating never cut down on the site of the original wound, for you will most likely be disappointed, but operate an inch above the last incision.

Tumour of the cut end of the nerve is not in my experience common. I exclude from this the nodular enlargement which forms at the end of all divided nerves; these club-like swellings of almost cartilaginous hardness never give rise to lameness; they are not true neuromata. These latter are histologically distinguished by a formation of true nervous tissue in the tumour; but in false neuromata, such as are seen always on the cut end of the nerve some months after neurectomy, the structure is made up of fibrous tissue, being simply an increase in the connective tissue of the nerve itself.

Painful swelling of the extremity of a nerve or true neuroma is not difficult to diagnose; they sometimes attain a great size, cause excessive lameness, and are exquisitely tender on pressure. The only treatment for them is excision; they are not recurrent.

Sloughing of the hoof is a serious complication: it is supposed to occur through putting the feet down heavily, and so producing inflammation and gangrene; it is, I believe, considered to be most frequent in cart horses, and is supposed to be more common after high and double neurectomy than after the low operation. Another condition named as favouring it is operating while there is any acute inflammation existing in the foot. I have fortunately only met with one case of the disease; it was certainly not due to inflammation existing in the foot, nor to the animal putting his feet down heavily, but I am convinced it was due to high and double neurectomy.

The symptoms commenced on the third day after operation, by swelling of the limb, and a slight oozing of blood from the heel. The swelling around

the coronet rapidly increased, and a separation of the wall from the coronet commenced where the oozing first occurred; this separation gradually within the next two or three days extended completely around the coronet, and by this time the foot had commenced to slip forward, so that at the heel one could easily look into the foot, which might have then been pulled off. The animal suffered, of course, no pain; but he was destroyed. On post-mortem examination the coronary band was found enormously hypertrophied, the coronet of great size, and, on incising it to remove the skin, large quantities of serum poured from it. The nerves were found at the seat of injury surrounded by serum, and they looked congested. At the heel the swelling was very doughy; the pedal bone was necrosing, and the sensitive laminæ in parts separating and gangrenous. As the result of nerve-stretching in the human subject peculiar forms of ulceration of the toes have lately been observed, with destruction of the part. I believe these lesions are identical with those observed in the horse; the exact explanation of the occurrence is difficult, but there is no doubt that it is produced by some serious change in the nutrition of the part, due to loss of nervous supply.

To prevent the occurrence of Sloughing, the French propose to perform the operation in two parts, viz., to excise the nerves of one side first, and, after some time, those of the opposite side; they hope by these means to prevent the accident, by gradually and not suddenly cutting off the nervous supply.

Gelatinous Degeneration.—This so-called Gelatinous degeneration is an interesting pathological condition which requires working out. There can be no doubt that it is, like Sloughing, due to serious malnutrition, resulting from loss of nervous supply. Of the exact histological changes we are ignorant.

I have met with two or three cases of Gelatinous degeneration. They occurred some considerable period after the operation—as long as two years. The invasion of the disease is slow, and is usually observed first in the hollow of the heel, and extending up the back of the pastern. The whole of the tendinous structures gradually give way.

After the second or third day of operation I send the horse to gentle exercise. If I find the wounds healing by the first intention I delay this; but if suppuration is established I do not find that exercise exerts any ill influence, nor delays the healing processes. I commence with two or three days' walking exercise—the time of which may be gradually increased, then trotting, and, lastly, cantering and galloping; if the horse is to be used for saddle purposes, jumping. It is surprising how quickly an animal feels its legs; the uncertain walk soon passes away, and a good, firm, confident tread is established.

In my opinion we possess in neurectomy a valuable therapeutical means which is not sufficiently adopted, which, in well-selected cases, will, bar accidents, give excellent results, and restore to usefulness many an animal which would otherwise be either sold or destroyed for that bane of horseflesh, Incurable lameness.

THE January meeting of this society was held on the 6th, at the usual meeting-room, and was well attended. Messrs. Campbell, of Kirkcudbright, and W. J. Mulvey, of Bishop Auckland, were among the visitors present. The chair was taken by the president, Mr. James Rowe.

Mr. J. F. Simpson and Mr. S. Slocock were ballotted for and elected members of the society.

The SECRETARY then explained that as the printer had not supplied the copies of Mr. Smith's essay on "Neurectomy" in time for distribution, it had been decided to postpone the discussion on that subject, and Mr. Roots had prepared a short paper as an introduction to a debate that evening.

Mr. Roots was then called upon and read his notes, dealing with the various causes, the symptoms, and treatment of Pulmonary Congestion; he

drew largely from his case-book for illustration of the various points to which he directed attention, and gave some cases of interest at length.

Mr. J. SIMPSON said he attributed the comparative infrequency of Pulmonary Apoplexy in country practice to the fact that it was the rule to get for the patients an abundant supply of pure air. Mr. Roots had, he thought, treated too lightly the subject of the duration of the disease; it was not usual to see the rapid subsidence of symptoms and short duration of the case indicated in the essay. In detailing the treatment, the application of hot water was not alluded to; he (Mr. Simpson) relied greatly on this, applying round the animal's chest a rug which had been dipped in hot water and wrung out, and covering the rug with a waterproof sheet.

Mr. WRAGG thought the essayist had chosen a wide subject, and had only treated of Pulmonary Congestion as a result of cold. In the paper a case was cited of Laminitis supervening on the chest attack, but it was a fact that in some cases Pulmonary Congestion was induced by the pain and excitement caused by Laminitis; it also occurred in Influenza, as a result of the vitiated condition of the animal's blood in the lungs. Congestion of lung also supervened on cases of, so-called, azoturia, and in cases of severe suffering from accident, or pain from sandcrack and other injuries. He thought that a horse seldom died from Pulmonary Congestion alone, but that the inflammatory stage was reached before death. Pneumonia, he said, rapidly followed congestion unless averted by bold doses of diffusible stimulants.

Mr. SIMPSON said he omitted to allude to a form of Pulmonary Congestion, which he had occasionally found follow Parturient Apoplexy in cows. The brain seemed to get sudden relief at the expense of the lungs. Unfortunately he had always found the pulmonary attacks fatal.

Mr. VILLAR thought, with Mr. Wragg, that Pulmonary Congestion, pure and simple, was very rare; one of its frequent concomitants was Congestion of the liver. He had frequently observed, more especially in subacute forms of the disease, a yellow appearance of the mucous membranes; in such a case he administered four ounces of sulphate of magnesia with diffusible stimulants, and when the patient had been under favourable conditions as to stable and clothing, he had found the temperature fall as much as two degrees in a very few hours. Simple Congestion did occur in some instances, as from over exertion in the hunting field, and in heavy town draught work in hot weather, and in cases such as these he was inclined to regard favourably the old-fashioned remedy of bleeding; he had tried it, and was satisfied. Might not, he said, the symptoms mentioned by Mr. Simpson have been caused by the entrance of foreign matter into the bronchial tubes, as is known to happen in Parturient Apoplexy during the administration of medicine.

Mr. BROAD agreed with Mr. Villar as to the liability of medicine administered by the mouth to enter the bronchii, but he did not believe that could possibly be the cause of the symptoms alluded to by Mr. Simpson, as a marked improvement in the general state of the animal was observed coincidently with the pulmonary attack. He had himself had cases of Parturient Apoplexy in which the sequence of affairs had been the same as in Mr. Simpson's cases. After severe cerebral disturbance had existed for periods ranging from eight to twenty hours, sudden relief to brain and spinal cord was found, the cow recovered consciousness, and got up, but the lungs were much obstructed; it seemed in these cases a complete metastasis of congestion. Fortunately, his cases differed from those of Mr. Simpson by terminating in recovery. He treated them as ordinary attacks of Lung Congestion. He had long used the hot blanket and waterproof sheeting, and said he could not too strongly express his opinion of their value. In chest complaints he had frequently observed the complication mentioned by Mr. Villar, and had found the benefit to be derived from a small dose or two of sulphate of mag-

nesia. He believed that in these cases there existed inflammation of the mucous membrane of the small intestines, and that it caused obstruction of the biliary duct.

Mr. CAMPBELL said he would not like to say that he had ever seen a case of simple, uncomplicated Hyperæmia of the lungs without any tissue changes. Mr. Roots had, he said, in his endeavour to shorten his paper, omitted to give a description of the morbid anatomy of his subject. This he rather regretted. Mechanical Hyperæmia must be attributed to a cause, and that cause a mechanical obstruction of the passage of the blood back to the heart. It might sometimes be a cardiac affection, or a want of tone in the bronchial mucous membranes.

Mr. T. MOORE differed from the essayist in his remark that the Congestion originated in the veins and extended to the capillaries. The reverse of this was the fact. As illustrating Mr. Campbell's remarks, he would recall a case of Congestion of the lungs which he had some little time ago. The horse was suddenly seized with difficulty in respiration, was attended at once, and watched till midnight. In the morning it was dead, and a clot of blood was found obstructing the pulmonary vein. He considered that there were several causes tending to produce the Congestion in cows remarked upon by previous speakers, such, for instance, as the long continuance of the recumbent position, with absence of movement, and the mechanical pressure on the chest. Doubtless, also, there was a nervous origin, which must not be overlooked. The administration of medicines during the comatose stage was a probable cause of Congestion from the escape of medicine into the bronchii. He did not subscribe to the doctrine of giving powerful stimulants; it was asking the heart to propel more blood through vessels already overloaded. He would try to relieve the gorged capillaries by other measures, and thus allow the heart to right itself. He thought the state of Congestion was of short duration. Mr. Roots spoke of cases lasting a fortnight; surely there must have been Pneumonia. He did not advocate using hot-water appliances; they were heavy, and interfered with the action of the respiratory muscles. In Congestion of the lungs there was, he noticed, a relation between the respiration and the pulse, the latter being generally ten or twelve beats higher than the number of the respirations; in Pneumonia the respiration was not so accelerated as in Congestion, and the pulse was relatively higher. The medicine he gave was Liq. Ammon. Fort.; he gave five minims in two ounces of water every quarter of an hour.

Mr. SIMPSON asked Mr. Moore whether he considered his medicine a stimulant, and, if not, in what manner he considered it acted.

Mr. MOORE said he believed the ammonia had a chemical action; it liquefied the thick blood in the congested capillaries.

The further discussion of the subject was then adjourned.

The following resolution, proposed by Mr. RAYMOND, was unanimously passed:—"This meeting expresses its confidence in the Examiners of the Royal College of Veterinary Surgeons, sympathises with those members of that body who were exposed to insult and annoyance while engaged in their duties, and regrets that the ringleaders in the disturbance have not been discovered."

ALFRED BROAD, Hon. Sec.

ROYAL COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE fourth annual meeting of the above Association was held at the Great Western Hotel, Reading, on 25th February, under the presidency of Henry L. Simpson, Esq., J.P., F.R.C.V.S., Windsor (who is Mayor of the Royal Borough). There were also present—Messrs. Wragg, London; J. F. Simpson, Maidenhead; Flanagan, Wheatley, and Barlow, Reading; Woods, Wigan; Blakeway, Stourbridge; Banham, Cambridge; McKinder, Peterborough;

Rowe, London; Walker and Verney, Oxford; H. G. Lepper, Aylesbury; Varney, Winslow; Wilkins, Lambourne; Lant, Bath; Hanks, Wantage; Wilson, Berkhampstead; Irving, Chipping Norton; Walker (1st Life Guards), Windsor; Howard, Newbury; Pack, Maidenhead; Carter, Guilford; Kidd, Hungerford (Hon. Sec.); etc. After the minutes were read and confirmed, Mr. Villar, M.R.C.V.S., Harrow-on-the-Hill, Middlesex, was unanimously elected a member of the Association. The rules of the Association were taken as read. The list of members was read, numbering fifty-eight. The report of the Stained Glass Window Committee was read, which stated that they had accepted the design of Messrs. A. L. Moore and Co., Southampton Row, London, for stained glass window, to be fixed in the Board room of the Royal College of Veterinary Surgeons (not the Royal Veterinary College). The design represents Veterinary Science, and is illustrated by a professor lecturing on anatomy. The Royal arms are also introduced, the arms being shown above the subject, whilst the supporters and motto are placed beneath. The emblem of medicine (flames issuing from a cup) is also depicted at the base of the window; and in the medallion, in the top portion, three horses' heads (after Landseer) are introduced. The next meeting is fixed to take place in July at Windsor. After the consideration of the election of Members of Council in May, 1887, it was unanimously resolved to support Messrs. J. Roalfe Cox and F. W. Wragg, who are the nominees of the West of England and Central Veterinary Medical Associations respectively.

The PRESIDENT then addressed the meeting. Thanking, in the first place, the members of the Association for the honour they had conferred on him by electing him President, and asking them to accept from him a short speech in place of an elaborately-written address, which latter he had been unable to prepare, owing to the calls upon his time in this very exceptional year.

Having touched upon the objects in establishing veterinary medical associations, he referred to the many advantages, both professional and social, to be derived from the occasional mustering of veterinary surgeons, who would otherwise be strangers to each other.

Referring more particularly to the Royal Counties Veterinary Medical Association, he stated that it was the junior association, having been established only four years ago.

The popularity of his predecessors and the business-like method of carrying on the work of the Association by their excellent friends, the Hon. Secretary and Hon. Treasurer, Messrs. Kidd and Walker, had inspired confidence, and at the present time the total number of members was fifty-two. The attendances as a rule were good, the discussions upon interesting cases and post-mortem specimens were increasing, and he urged members to bear this fact in mind, as one of the principal objects of the Association was to encourage these discussions.

Allusion was next made to the Royal College of Veterinary Surgeons, and the President laid before the members the condition of the building fund, which was still indebted to the College fund to the extent of £1,600, and a very strong appeal was made by him to those members of the profession who had not yet subscribed to the Institution, of which the members of the profession might justly feel proud.

He next referred to the yearly increasing interest taken by the members in the elections, stating that, whereas not long ago, and before the present system of voting came into operation, twenty votes were sufficient to ensure a seat upon the Council, about 650 votes were recorded for him last year, placing him at the head of the list of successful councillors of the Royal College. Having referred to the various duties of the Council, which were not at all times pleasant, he stated that the members of the profession began to acknowledge freely to what an extent the passing of the Veterinary

Surgeons Act was likely in a few years to benefit members of the College. Brief reference was made to the disturbances by veterinary students in Edinburgh, the President avoiding the mention of details, as a committee was about to investigate the matter.

Two questions, he said, were now engaging the attention of veterinary surgeons, namely, our horse supply, and the working of the Contagious Diseases (Animals) Act.

With regard to the former, he drew attention to the fact that some three years ago, a paper on that subject was read before the members of the Association by his brother. His suggested remedy was government assistance, not by the establishment of large breeding establishments, but by obtaining for the use of the country a large number of the best stallions of all classes, and allowing agriculturalists to send their mares to them for a nominal fee, care being taken that no mares should be allowed the services of these stallions, unless certified by the appointed veterinary surgeon of the district to be free from hereditary disease.

Now that exportation of horses from some countries was prohibited, the scarcity of home-bred horses would be realised; it was a serious question, and one which the English Government would have to face very shortly.

The Contagious Diseases (Animals) Act and Orders had been the means of keeping this country comparatively free from many diseases; thus in 1881, according to the return issued by the Privy Council, 5,823 diseased animals were imported into this country and detained. The inconvenience and loss to those who send their ship loads of cattle is so great, that in their own interest they take every precaution to avoid seizure on landing. Now so stringent are the foreign and landing orders, that in 1885 only 27 diseased animals were brought to this country, and of that number 16 were cases of Sheep-scab. This is a matter of congratulation to the professional advisers of the Privy Council.

Unfortunately Pleuro-pneumonia has spread very rapidly in Scotland; thus in 1885 the number of outbreaks in that country was 60, whereas in 1886 they numbered 200, while the number of animals attacked rose from 415 to 1,000. The subject of inoculation is engaging the attention of many members of our profession, and a hope was expressed that at the next meeting a paper would be read before the members by one who had given the question very serious consideration.

Reference was made to the extraordinary freedom from Glanders, which was enjoyed by Scotland and Wales, and the interesting statistics issued by the Privy Council were laid before the members, by which it appeared that London was the centre for Glanders and Farcy, and that the returns from those counties whose horses go in and out of London contribute largely to the total number for England.

In 1885 the total number of cases of Glanders and Farcy in England was 532; in Scotland, 4; and in Wales, 2.

The scheduling of Anthrax and Rabies, as diseases under the Act, was a wise measure, and the returns from the Privy Council with regard to those diseases will be looked for with much interest and anxiety by all.

Having said a few words in praise of the National Veterinary Medical Association, and pointed out the good work which was being done by the National Benevolent and Mutual Defence Society, the President concluded by inviting the Association to visit him in July, at Windsor.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting was held at the Blackfriars Hotel, Manchester, December 8th, 1886.

Present: Thomas Briggs, Esq. (President), Messrs. P. Taylor, Thomas

Greaves, W. Whittle, J. Lawson, W. A. Taylor, T. Hopkin, T. Leather, A. Leather, J. Bridge, S. Locke, R. Herbert, A. Lawson, J. B. Wolstenholme, W. Woods, jun., G. Ellison, T. E. Horrocks, H. Ferguson, and J. W. Ingram.

Visitors: Dr. Wolstenholme, Messrs. R. C. Edwards and J. Moore.

Read circular convening meeting.

Minutes of the last meeting were read and confirmed.

Letters of excuse for non-attendance were received from Professor Williams, Messrs. E. Faulkner, J. W. T. Moore, James Marshall, and J. S. Hurndall.

Letters from Mr. E. Faulkner and Mr. J. S. Hurndall were read, saying that, under the circumstances, they had much pleasure in withdrawing their resignations.

Mr. W. A. TAYLOR nominated Mr. A. B. Wren, M.R.C.V.S., Manchester, and Mr. J. Munro, M.R.C.V.S., Altrincham, as members of this Association.

Proposed by Mr. W. A. TAYLOR, seconded by Mr. GREAVES, that the best thanks of this Association be given to the office-bearers for the past year. Carried unanimously.

The TREASURER (Mr. W. Woods, jun.) then read his annual report, which in due course will be printed and circulated.

Resolved that the late Auditors, Mr. J. Lawson and Mr. T. Hopkin, be re-elected.

Mr. GREAVES proposed, seconded by Mr. T. HOPKIN, that Mr. T. Briggs be re-elected President for the ensuing year. Carried unanimously.

Mr. P. TAYLOR proposed, seconded by Mr. J. B. WOLSTENHOLME, that Mr. A. Leather be elected Secretary. Carried unanimously.

Mr. GREAVES proposed, seconded by Mr. P. TAYLOR, that Mr. W. Woods, jun., be re-elected Treasurer. Carried unanimously.

Mr. P. TAYLOR proposed, and Mr. WHITTLE seconded, the election of Messrs. S. Locke, J. B. Wolstenholme, and A. Darwell, as Vice-presidents. Carried unanimously.

Mr. J. B. WOLSTENHOLME then read a very interesting and carefully-compiled paper on

RABIES AND HYDROPHOBIA.

MR. PRESIDENT AND GENTLEMEN,—Responding to the request of our worthy Chairman that I should introduce a subject for discussion at this meeting, I have ventured upon that of Rabies and Hydrophobia.

In this subject centres at the present time a very vortex of interest alike to the general public, the surgeon, and the scientist.

Rabies and Hydrophobia, viewed from the standpoint of its mortality, need excite little attention, but, when considered with regard to the protracted and terrible anxiety which is experienced by those bitten by a rabid animal, and the agonising certain death which follows if the disease has been contracted, attention is arrested and interest is aroused, but this interest rises to the highest point when a cure is announced on good authority, and by a method which bids fair to revolutionise or to be an important factor in revolutionising all our preaccepted ideas of disease and its treatment.

Rabies and Hydrophobia have been recognised for centuries. Of the symptoms, I need only remark that in the dog there is no dread of water, nor any nervous paroxysms on seeing it, or in attempting to swallow the same.

In the dog also we recognise two varieties of Rabies, viz., furious and paralytic, or dumb Rabies; in the human subject one form only is seen, and that a modification of the furious description.

Of the treatment of Hydrophobia in the past, one is tempted to say that every means to prevent and cure had been tried, and proved futile; charms, incantations, and nostrums, methods of rational and irrational treatment, have been multiplied *ad infinitum;* the ignorant have quacked, and the learned have pondered, but no progress has been made.

From this point, gentlemen, I desire to draw your attention to the studies of M. Pasteur, who, commencing some 30 years ago, confirmed the observations of Dumas that fermentation was a process induced and maintained by the growth and development of a certain living organism.

His further researches have established the fact that all forms of fermentation and putrefaction are due to similar physiological phenomena.

His continued discoveries have placed him in the van of those who maintain that there is no life except from pre-existing life, whilst the masterly manner in which he has demonstrated that a minute vegetable organism is the cause of such devastating diseases as "Pebrine" and "Flacherie" in silkworms, Cholera in fowls, and Anthrax in cattle, has qualified him in the highest degree as an investigator of the specific nature of Rabies and Hydrophobia.

Pasteur's investigations have not terminated when the precise *cause* of a disease has been arrived at. No! Steadily following the line, making experiment after experiment, and verification in abundance, he has perfected a mode of inoculation which gives immunity from Fowl Cholera and Anthrax, and leads thoughtful men to consider that all the so-called specific diseases with incubative periods are due to the presence of similar minute organisms, and that it may be possible to modify or control these diseases by introducing into the economy either the obnoxious microbe itself, after it has been prepared by particular culture, or by introducing other microbes, which experiment has demonstrated as being antagonistic to, and destructive of, the former and disease-producing germs.

In the year 1880, Pasteur's position as a physiological and pathological savant was something as I have just attempted to sketch. In December of that year a child died of Hydrophobia in one of the Parisian hospitals; she had been previously bitten by a dog undoubtedly rabid. Shortly after death Pasteur took a little of the saliva from this child's mouth, and inoculated some rabbits with it; the rabbits died in about thirty-six hours afterwards. Other rabbits were inoculated from these, and others in succession were inoculated, both by means of their saliva and blood; each series died in a shorter period than the one preceding it; but the symptoms exhibited were *not* those of Rabies.

Further investigation showed the presence in the blood of a microbe in the form of a figure of 8; this was also found in normal human saliva. However, cultivation of this organism in veal broth produced death in rabbits, and Pasteur considered it a new disease.

Continuing his experiments with rabid dogs and rabbits, Pasteur came to the conclusion that the poison did not exist in the blood, for it was found that Rabies did not follow when blood from a rabid animal had been injected into another.

After this Pasteur determined to seek for the virus in the nervous system, as suggested by M. Duboué in 1879. He commenced by inoculating with small portions of the medulla oblongata, frontal portion of the cerebral hemispheres, and with cerebro-spinal fluid, from animals which had died of Rabies; these inoculations resulted in death from Rabies in periods varying from eight to forty days. He also found that the transmission never failed when the inoculation was made beneath the dura-mater, and also he noticed that the period of inoculation was shorter when the poison was thus introduced.

In 1882 Pasteur announced to the Academy that he had by further experiment verified his previous conclusions, and he was of opinion that in inoculating with the saliva of a rabid animal death might ensue in one of three ways, viz.:—

1st. In a few hours by what, in 1880, he called a new disease, viz., that due to

the proliferation of the diplococcus (figure of 8 microbe) in the blood and tissues.

2nd. From Pyæmia.

3rd. From Rabies.

Further experiments demonstrated that when nervous material from a rabid animal was injected beneath the dura-mater, or injected into the veins, each was equally certain to produce Rabies, and also with about the same period of incubation, but this difference was also observed, that when the inoculation was into the cranium, Rabies in the furious form usually resulted, whilst venous injection was generally followed by dumb Rabies.

In 1884 Pasteur announced that as a result of further observation he found that the rabific virus was present, not only in the saliva and central nervous organs, but also in the salivary glands and the peripheral nerves. This latter fact was demonstrated, as I have read somewhere, by a French veterinary surgeon in 1803, who took a portion of the crural nerve from a rabid cat whilst alive, and with it inoculated a dog, which, in due course, died with Rabies.

These experiments further indicated that, irrespective of mode of introduction, the form of Rabies (furious or dumb) induced in the dog was due to the *amount* of poison injected, that furious Rabies succeeded a small quantity, and that Paralytic Rabies followed a large dose.

The next stage in these discoveries was the observation of the fact that when Rabies has been transmitted through a series of animals of the same species, the virus attains the property of reproducing Rabies in a very definite period, for, previous to this condition being arrived at, the incubative period could not be calculated to nearer than two or three days, whilst now Pasteur is able to prognosticate the first appearance of the symptoms to within a few hours.

Continuing these researches through series of animals, not only was the property of *definiteness* still further verified, but it was found that in the case of guinea-pigs and rabbits, each successive inoculation rendered more virulent the produced virus, until a certain maximum was attained, at which the standard of virulence was maintained so long as the same species of animal was the subject of experiment. On the other hand, it was found that the same virus, passed through a series of *monkeys*, became weaker and weaker until a strength was arrived at in which no symptoms of Rabies resulted where a dog was inoculated from a monkey. Again, if this attenuated virus was repassed through a series of rabbits it was found to become gradually more and more virulent until the maximum was again attained.

The maximum of virulence thus obtained in the rabbit was found to be more powerful than the virus obtained from a rabid dog.

Again, as this virulence increases in its successive passage through rabbits, so also does the period of incubation become shorter and shorter, until at the condition of maximum strength, the minimum period of incubation is almost reached.

Thus, in the first rabbit (inoculated by means of cerebral tissue taken from a dog dead from Rabies, and introduced into the cranium of the rabbit), an average incubation period of fifteen days is obtained; but when a series of twenty to twenty-five rabbits in succession have been inoculated, the one from the other, the period of incubation is reduced to eight days, which is further shortened to seven days at about the fiftieth rabbit.

Now the question arose as to whether the virus obtained by passage through a series of monkeys, attenuated so as not to be able to produce Rabies in the dog, was possessed of an prophylactic property or not, and it was found that it was.

The method finally adopted was to inoculate a dog with this attenuated virus, and at the same time inoculate a rabbit; in due course the dog was

reinoculated from this rabbit, and a second rabbit was inoculated, and so on through a series, reinoculating the dog with virus from each successive rabbit, until the condition of maximum strength of virus was obtained.

The dog remained apparently healthy, although he had been injected with a rabific virus which invariably produced Rabies and death in a dog which had not been thus led up to its tolerance.

A committee was appointed to investigate this prophylactic treatment, and they reported upon it in August, 1884.

Nineteen dogs were taken and submitted to the following tests, viz.:—

Six were bitten by rabid dogs—three died; eight were inoculated with rabid virus, from the nervous system, by injection into the veins—six died; five were inoculated under the dura mater—five died; all from Rabies.

Then twenty-three dogs which Pasteur had prepared were taken and submitted to similar tests; in twenty-two of them no ill effects followed, but one died—this was in all probability not from Rabies, as three rabbits and a guinea-pig were inoculated with cerebral matter from the dead dog, and no Rabies or other disease followed.

Many experiments were conducted with spinal cords of rabid animals, in order to see what change was effected in them. They were submitted to various conditions of temperature, were kept in vacuo, in carbonic anhydride, in dry and moist atmospheric air, etc., etc.

One effect ascertained was that when a portion of spinal cord, removed under antiseptic precautions from an animal dead from Rabies, and inserted into a jar of dry atmospheric air, and there maintained free from external microbic infection, it gradually lost its virulence, and that finally it became inert

A moderately warm temperature was found to accelerate this process, and a reduced temperature retarded it.

To test whether any prophylactic value was obtained by means of this new method of attenuation, a dog was inoculated, first, with a mixture of sterilised broth and a portion of spinal cord which had been suspended long enough to lose its rabific properties, as proved also by experiment (the inoculation was made beneath the skin), then on each succeeding day the dog was reinoculated with broth and spinal cord which had been suspended for a period one day shorter than that used on the previous day; this was continued until the dog was inoculated with the most recent and most virulent nervous material. The dog did not become rabid, and afterwards withstood any test to which he was submitted.

In 1885 Pasteur had fifty dogs, which were in this manner rendered refractory to Rabies; he had not had a single failure.

Up to this point all the experiments were performed with the object of so preparing the system of the patient that when the most powerful rabific virus should be introduced, it would be proof against it, as a completely fermented liquid is proof against, or contains no pabulum for the growth of the same ferment; and also as in the case of vaccination, we observe a modifying or sterilising effect on the introduction of the Small-pox virus.

This prophylactic property is, of course, widely different from that of a remedy or specific for the cure of a disease. In the former a healthy organism is subjected to treatment, whilst in the latter case the disease in its ordinary mode of development is more or less established; yet, if we sought for a parallel, I think we might again cite vaccination for Small-pox, for I think that our medical confrères admit that vaccination subsequent to the infection of Small-pox exerts a modifying influence.

However, Pasteur, reflecting upon the long period of incubation in Rabies, succeeding the bite of a rabid animal, and the comparatively short space of time requisite to render refractory by the prophylactic method, imagined that possibly post-vaccinations might be efficacious.

This was the position of experimental research, and the attitude of Pasteur's mind when, on the 6th July, 1885, a child, Joseph Meister, arrived in Paris. This boy had been bitten in fourteen different places by an undoubtedly rabid dog, a dog which not only exhibited all the symptoms during life, but had the usual *post-mortem* conditions. Meister was inoculated beneath the skin with the mixture of sterilised broth, and a fragment of spinal cord attenuated to the point of inertness by suspension in dry air. The inoculations were continued from spinal cords of increasing virulence in the manner, as described with respect to the dog; in all Meister was inoculated thirteen times in ten days.

From July, 1885, up to the end of October in this year, some 2,496 persons have been treated for Hydrophobia at the establishment of Pasteur. Of these, the great majority have come to him, accompanied by a certificate from a veterinary surgeon, or a surgeon, stating that the animal which had inflicted the wounds was at the time rabid. Of 1,700 French patients thus treated, only ten have died. On the other hand, of the small minority of cases in France not sent to M. Pasteur, there have been seventeen deaths from Hydrophobia in the same period of time.

The average number of deaths from this cause in the Parisian hospitals alone during the last five years, have been eleven per annum. Serious wounds about the face and head, especially when inflicted by wolves, seem to demand a more rapid and continued treatment than was instituted at the commencement, and to this end Pasteur has of late been directing his energies.

Gentlemen, in thus opening the discussion, I trust that, as the evening advances, further explanations of the process employed by M. Pasteur will be elicited. Indeed, until I heard from Dr. Dreschfeld last evening, I had hoped that we should have had the pleasure of a detailed account from that gentleman of the *modus operandi*, as he observed it last summer.

In conclusion, gentlemen, I beg to submit this paper to you as a slight expression of high admiration of the genius and untiring industry of the learned gentleman whose studies have formed its basis.

A long and interesting discussion followed, in which most of the members took part.

A vote of thanks to the essayist was proposed by Mr. P. TAYLOR and seconded by Mr. JOHN LAWSON, and embodied in this resolution was a request that Mr. Wolstenholme should acquaint Dr. Dreschfeld that it was the unanimous and earnest wish of the Association that he should at the next meeting, if convenient, kindly be present and give his experience and views of Rabies and Hydrophobia.

The PRESIDENT then introduced the subjects of which he had given notice, "The Anthrax Order of 1886 (No. 3,447)," and "The Rabies Order of 1886 (No. 3,448)"; of the Contagious Diseases (Animals) Act, as to—

(A) What constitutes "Anthrax" within the meaning of the order? and

(B) Under what circumstances will a veterinary surgeon's premises come under the Rabies Order.

A short discussion took place, and it was decided that the matter should be reopened, if occasion required.

The usual vote of thanks to the President concluded the meeting.

THE annual meeting and dinner of the above Association was held at the Grand Hotel, Piccadilly, Manchester, on Friday, February 18th.

Present: Mr. Thos. Briggs (President), Professor Pritchard, Messrs. F. W. Wragg and James Rowe, London; J. F. Simpson, Maidenhead; Peter Taylor, W. A. Taylor, Thos. Greaves, T. Hopkin, J. B. Wolstenholme, Dr. Wolstenholme, A. Lawson, J. Lawson, and Chas. Challinor, Manchester;

Wm. Whittle, Worsley; H. Ferguson, Warrington; U. A. Cleeve, Liverpool; G. H. Darwell, Northwich; Wm. Woods, jun., and Dr. Wilson, of Wigan; Dr. Liptrot, Stretford; John Litt, Bolton; N. J. Harrison, Bowdon; J. H. Carter, Burnley; G. W. Carter, Keighley, Yorkshire; T. H. Simcocks, Drogheda; J. Faulkner, Rochdale; Jas. Briggs, Prestwich; Dr. Jones, Dr. McLaren, J. Barlow Hopkinson, S. F. Butcher, and G. Ball, of Bury; and Arthur Leather, Liverpool, Hon. Sec.

Letters of apology, regretting their inability to attend, were read from upwards of eighty members and friends.

The SECRETARY then read the circular convening the meeting.

The minutes of the preceding meeting were read and confirmed.

Proposed by Mr. W. A. TAYLOR, seconded by Mr. J. LAWSON, that Mr. A. B. Wren, of Manchester, and Mr. J. Munro, of Altrincham, be members of this Association.—Carried unanimously.

Mr. THOS. GREAVES nominated for membership Mr. J. S. Carter, M.R.C.V.S., of Burnley.

The PRESIDENT, Mr. Thos. Briggs, proposed, seconded by Mr. THOS. GREAVES, that Mr. William Whittle be the nominee of this Association for election to Council.—Carried unanimously.

Mr. WM. WHITTLE proposed, seconded by Mr. T. HOPKIN, that the Lancashire Association combine as heretofore with the Liverpool, Midland, and Yorkshire Associations, to conjointly secure the return of their various candidates.

The PRESIDENT (Mr. Thos. Briggs) proposed, seconded by Mr. H. FERGUSON, that the usual election committee be appointed.—Carried unanimously.

The PRESIDENT delivered an address, and after thanking the members for having honoured him by electing him for a second time to fill that chair, he went on to say that the benefits that had accrued from that and kindred associations were incalculable.

The Lancashire Association, he was proud to say, stood in the foreground. In speaking of the work done by the Council of the Royal College of Veterinary Surgeons during the last year, he thought the workers deserved the thanks of every member of the profession. He was sorry there was still a debt upon the new building in Red Lion Square. He had only given a mite, so far, himself; but he hoped before the present Jubilee year was over, the debt would be wiped out, and he hoped, too, to be able to give another, if a somewhat small donation. Considerable discussion and letter-writing had happened in connection with the examining boards of the past five years. Personally, he was in favour of veterinary surgeons only filling the position of examiners, and he sincerely hoped the Council would not be led astray by the remarks of men who are more or less interested, and consequently—unwittingly it might be—biased. The disgraceful and disorderly proceedings of the students at Edinburgh were a source of regret. Surely by this time everybody has regretted that such conduct happened. He could not but blame certain teachers for, to his mind, the unwise support and counsel given to the students, actually after there should have been time for reflection. He had received a letter from Professor Walley, denying this countenance, and as the Professor had given permission, he would read the letter. He would not like it to be inserted in either of the Journals, as the letter was not couched in quite courteous language. The Council of the R.C.V.S. had met on Wednesday last upon this special question, but he could not say what had taken place. No doubt, in the after-dinner speeches something would be heard upon this subject. The Council and the examiners certainly deserved the support of the outside profession, and the examination was very far from being stiff, so far as his knowledge went. It seemed

strange that many members of the College in Red Lion Square did not know the exact relations between it and the four teaching colleges. The public, of course, knew less. It did not know that we had—what the medical profession has been struggling for for years—a conjoint examining board; and that the teaching schools taught whilst the R.C.V.S. examined and granted diplomas. Seeing that no discussion could follow the President, he would briefly allude to a few of the common cattle diseases, which so materially affect every man, woman, and child in this country. Foot-and-mouth Disease, he thought, was all but "non est," and this was due to the vigorous exertions of the Privy Council. Pleuro-pneumonia was still raging in Scotland, and that poor benighted country, Ireland, was blamed for the fact. He would like to have said something upon inoculation, but thought he knew nothing new. Tuberculosis (or Consumption) in cattle, was, if anything on the increase; heredity and high-feeding, with want of sanitary habitations were, undoubtedly, the principal causes. Sooner or later Tuberculosis would form part of the category of diseases coming under the Contagious Diseases (Animals) Act. Rabies in dogs and other animals and Anthrax in cattle were by a recent order brought within the Act. How far the Rabies order could be carried out, he did not know, but he thought he might venture to prophesy that nothing would come of it but trouble and annoyance. Anthrax, as meaning simply Splenic Fever, could be much more easily dealt with.

The members and guests afterwards took dinner, after which the usual patriotic and professional toasts were duly honoured, the intervals being enlivened by songs and musical selections contributed by several of those present. ARTHUR LEATHER, *Hon. Sec.*

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE annual meeting of the above Association was held in the theatre of the Medical Institute, Hope Street, on February 11th, 1887, the President (R. C. Edwards, Esq.) in the chair.

There were present: Messrs. Briggs, Barnes, Davies, Dobie, A. Leather, Morgan, Whittle, Woods, and the Secretary.

Letters, regretting inability to attend, were received from Professors Robertson, Williams, Walley, and McCall, Messrs. Wolstenholme, J. and A. Lawson, J. S. Hurndall, Smart, Locke, P. and W. A. Taylor, Greaves, and Faulkner.

After the usual preliminary business the TREASURER (Geo. Morgan, Esq.) read his report, which was duly adopted.

Mr. W. Woods, sen., Wigan, was unanimously selected as nominee of the Association for election as Member of Council R.C.V.S., and the officers of the Association were appointed to further Mr. Wood's candidature.

The PRESIDENT then delivered his inaugural address. After thanking the members for the honour they had conferred upon him, he proceeded to explain the benefits and pleasures which he had derived from attending the meetings of this and kindred associations. He then drew attention to the many advantages of the National Veterinary Benevolent Society and the Veterinary Mutual Defence Society.

The President regretted that some members of the profession amalgamated dealing in horses with their practice, and contended that the veterinary surgeon had plenty to do to practise his profession, without interfering with trades; that spare time should be devoted to studying the many complex diseases, with the view of discovering some remedial agents which have, so far, baffled the most learned.

After touching upon the subject of remuneration for services rendered, he

proceeded to analyse the late order of Privy Council concerning Rabies and Anthrax. Of the Rabies order, he thought the restrictions placed upon premises might very seriously affect veterinary surgeons' establishments, and suggested that the Royal College should take the matter up and use its influence with the Privy Council, with the view of liberating veterinary establishments from the restrictions.

Mr. T. J. DAVIES kindly communicated details of two interesting cases, which had occurred in his practice, and elicited a useful discussion upon them.

The usual votes of thanks brought the meeting to a close.

HENRY SUMNER, Hon. Sec.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE fifty-ninth quarterly meeting of the above Association was held at the North Stafford Hotel, Stoke-on-Trent, on February 11th, 1887. Members present: Messrs. A. Over (President), T. Greaves (Manchester), F. Wragg (London), F. Blakeway (Treasurer), Cross (Shrewsbury), J. Parker (Birmingham), R. C. Trigger (Newcastle, Staff.), H. Olver (Tamworth), E. Hodgkinson (Uttoxeter), C. Barnes (Cheadle), J. Malcolm (Birmingham), G. Smith (Tunstall), and T. Chambers (Dudley, Hon. Secretary). Mr. Theelan and Mr. F. Clunes (veterinary student) were present as visitors. Apologies for non-attendance were received from Professors Walley and Williams (Edinburgh), Axe (London), and Messrs. J. Reynolds, Verney, Price, Simpson, O. Hills, Golden, Perrins, Barling (Ross), Carless (Stafford), and Captain Russell.

The minutes of the previous meeting having been read and confirmed,

Mr. F. Blakeway called the attention of the meeting to the sad loss the society had sustained through the death of one of its members—Mr. A. J. Cartwright, of Wolverhampton. He felt that our time was so short that we ought to be even more united, and hold the right hand of fellowship to each other more strongly than ever, and he asked the meeting to pass a vote of condolence with the bereaved family.

Mr. Trigger, in seconding the resolution, said that in the loss of Mr. Cartwright (with whom he was articled) he personally sincerely grieved for a true friend of many years' standing.

Mr. Olver moved that a similar vote of condolence be forwarded to the family of the late Mr. E. Meek, of Walsall (another member who had been lost to us since our last meeting), and in doing so referred to the genial and kindly nature of the deceased, and his regular attendance at our meetings.

This was seconded by Mr. Chambers, and in each case general sympathy was expressed with the bereaved families by the members present.

The following gentlemen were duly elected members of the Association:—Mr. H. J. Dawes (West Bromwich), Mr. James Blakeway (Stourbridge), Mr. John Blakeway (Birmingham).

The Treasurer read a statement of accounts showing a balance in favour of the Association of upwards of £140.

Mr. Parker gave notice that, as the funds of the Association appeared to be in such a flourishing condition, he would, at the next meeting, move that a sum of £50 (second donation) be given to the College Building Fund.

The Treasurer reported that the subscriptions of certain members were in arrears, and that he made repeated applications for same, and that in some few cases the entrance fee had not been paid, and he asked the meeting to take steps to deal with such defaulting members.

Mr. Trigger gave notice that at the next meeting he would move that any member in arrears with his subscriptions for three years should be struck off

the roll of membership, also a resolution as to the payment of entrance fee, due notice of which he will give to the Hon. Secretary.

Election of Officers.

The following gentlemen were elected office-bearers for the ensuing year:—Mr. J. M. Parker (Birmingham), President; Vice-Presidents, Messrs. A. Over, F. Wragg, and J. Malcolm; Treasurer, Mr. F. Blakeway (re-elected); and Mr. T. Chambers (Dudley), Hon. Secretary (re-elected).

These gentlemen tendered thanks for the honours conferred upon them, and on the motion of Mr. Olver, seconded by Mr. Wragg, hearty votes of thanks were accorded to the retiring officers for their efficient services during the past year.

Candidate for Council.

Mr. F. Blakeway was unanimously chosen for nomination for the ensuing election.

Mr. Greaves then read an interesting paper on "Sanitary Stable Management." He said:—

I purpose to devote this paper to the different subjects so ably dealt with by Professor Pritchard before the Royal Counties Veterinary Medical Association, on 27th November, 1885, and published in January journals of 1886. The Professor invited free discussion upon the various interesting questions, or matter which he brought forward. My intention is not to differ with him, but rather confirm him in almost every particular by many forcible and interesting facts. Since then I had the pleasure of attending the next meeting of this Association, held at Reading in February, 1886, when a most interesting discussion took place upon the subject of the Professor's essay, and much very useful matter was elicited. I intend to follow on the same lines he took, and add my mite to its interest, by relating many interesting facts on the following subjects, viz.:—

1st. Drainage of Stables.
2nd. Ventilation of Stables.
3rd. The Relative Value of Bedding with Straw, Sawdust, and Peat Moss.
4th. Roofing of Stables.
5th. Feeding Horses—English Beans, Oats, Barley, Indian Corn, Chop, etc.
6th. Temperature of the Stable, Exercise, Clipping, etc.
7th. Conditioning, etc., Young Horses, when brought fresh out of the Breeder's or Dealer's hands.

In this manner, by the subjects being systematically studied and elucidated, will our profession be benefited.

Drainage of Stables.

Some of the horses I attend are in stables under railway arches. I could take you to forty stables so situated, some of them occupied by fifty-two horses. These had underground drains for forty years or more to my knowledge. These stables were notorious hot-beds of Influenza and Chest Influenza. It was their normal condition; although I sent report after report about it, and got ventilation improved as much as possible, still sickness, often fatal sickness, was constantly occurring in them. At length these drains were attended to. The unbearable stench in those drains cou'd not be believed, unless smelt when they were being opened; the men cleaning them out were obliged to work with handkerchiefs over their mouths and nostrils, and to go every few minutes into the open air, to enable them to live it out, but the poor horses had been tethered to the mangers, had to lie down and breathe the fœtid air, and sleep in it night after night for weeks and months, until their blood became so overcharged with the poison that

sickness and often death was the consequence. All the putrid, rotten decomposing matter in the drains was bodily taken away, the whole filled up with sweet gravel, surface drains laid, every stall, and the whole floor concreted, and newly paved, grouted and well asphalted, and now the stables smell sweet and wholesome; but more than this, Influenza and Chest Influenza have become a thing almost unknown.

Ventilation of Stables.

Upon this subject I entirely agree with the Professor. If we want pure air in the stable, the ingress must be on the ground surface, on a liberal scale, and the egress by means of a shaft at the highest point of the stable, but the ingress must be so arranged as not to cause a draught upon the horse's legs or on their heads. I condemn openings over each horse's head. A ventilating shaft with a gas jet constantly burning in it is the very best means of carrying away the heated and foul air. We know that particles of air, as they become heated, expand, become lighter and ascend to the higher stratum; they accumulate there, if not carried away. A shaft acts on the principle of a chimney; see the smoke ascend. You may tell me this is owing to its being a heated flue, but I can take you to some of these long shafts of tall chimneys, where there has been no fire for weeks, and the current of air is so strong in the shaft as to draw anything in reason up into the higher and more rarified air; there will be no down draught if there is sufficient and plentiful supply or ingress of fresh air on the ground surface. Nimrod, an old writer, speaks of the air that can enter through a key-hole being sufficient for a stable; but if the inlet of pure cool air on the ground surface is deficient in quantity, it will be found very difficult indeed to get rid of the foul air; it will be found sometimes traversing a direction just the opposite to that intended.

The Gas Jet burning in the Shaft.

This is a most valuable and ingenious idea, it is altogether a new idea, an innovation in the systems of ventilation of stables, many of which old systems it must be admitted are not altogether satisfactory, but this method which I am advocating will take the lead, and should be set forth beyond the shadow of any possible doubt. The principle of action is understood on scientific and thoroughly practical ground, its real utility and importance cannot be over-estimated; in finally deciding on the principle of ventilation, no element of uncertainty should be allowed to prevail. The gas jet is fixed in the centre of the shaft a little way up the shaft, its action is the same as the fire in the shaft of a coal mine; by its burning the air a vacuum is created, and the rest of the air in the shaft is rarefied the air below rushes in and ascends more rapidly, a current is created; it is well known that foul air is a bad traveller, but it will be found that under this contrivance the foul air is sucked up to the shaft and carried away more effectually than by any other known means, the temperature is lowered at the same time by the same means. I know stables in which the temperature has become reduced thirteen degrees lower than before the gas jet was in use.

Bedding.

For some time after sawdust had become more generally used I felt a prejudice against it; I thought it looked comfortless, cheerless, and miserable. I thought the horses looked cold and starved. For a time, I found many horses would not lie down on sawdust beds. Two of my employers, who have about 300 horses each in Manchester, have been using it for the last six or eight years. We find the horses do as well on it as on straw beds; I find the temperature of the stables is higher than in stables bedded with straw, as if heat is generated in the sawdust, and not in straw. Our experience is that in no sense

is it objectionable; the horses' skins are as clean and coats as glossy, their feet quite as good, and their general health is in every respect equal to those bedded in straw. Several of my employers use the moss litter, and in every instance they speak of it in terms of the highest praise; they speak of it improving the condition of the feet; they would not exchange it for either straw or sawdust; they speak of it being a great preservative to the feet, and also as being an active agent in securing good health; I know it is said that coughs and colds are almost unknown where it is used; no fear of choking drains if surface drains are used, which are always sweet and clean.

Roofing of Stables.

Again I am entirely with the Professor; slates and corrugated iron roofs are cold in the winter and hot in the summer; thatch is just the reverse. The thatch is often eight, ten, or twelve inches in thickness. The hottest sun cannot penetrate; only the external surface is affected, the middle is moist, evaporation takes place. The evaporation abstracts heat from the interior and causes a lower temperature in the stable in the hottest weather; thatch is always cold on its under surface; slates and iron are often as hot on the under surface as on the upper surface, and this heat affects the temperature of the stable. I am in favour of a stable having a loft over it; having a floor, or ceiling over the stable, not too low, nor yet too high; *I am strongly opposed to too lofty stables;* it is quite unnecessary; *they are always cold stables.* I have a strong objection also to wooden stables; they are cold in winter and hot in summer; this is unavoidable; and no horse can feel warm in the skin, be comfortable, or rest in a cold stable.

Feeding Horses.

I do not intend to go into details about the exact quantities, etc., but to make a few remarks on several points of general interest. Always give food before water. I always had the belief that English beans were an essential for ensuring strength, endurance, and wind; during the coaching days English beans were the chief ingredient in their horse food; since then a change has come over our opinions. English beans are almost discarded—in many large establishments entirely discarded, they are such a fruitful source of itchy heels, etc., etc. It is found that barley, peas, lentils, oats, or Indian corn contains all the elements necessary to obtain condition, strength, and wind. The diseases of horses are many and varied; but there is this difference in the constitution, owing to altered condition, that whereas, twenty-five or thirty years ago, whilst horses were largely fed on English beans, nearly every bad case of Chest Influenza in my practice terminated in Hydrothorax. I have operated upon scores of cases, six cases in a week, but never had a case of recovery. Since then horses are fed chiefly on Indian corn; I scarcely see one case of Hydrothorax in six months, amongst the same class of horses, doing the same work, occupying the same stables, and attended by the same method of treatment. I recommend a large warm bran mash given to all horses once a week; give working horses oatmeal gruel once a day, or oilcake in their water occasionally.

Temperature of Stables.

A cold stable is comfortless; no horse can come on in a cold stable; if they are starved and cold they cannot rest; however well he is fed he will look bad in his coat and be poor in condition. If, on the contrary, the stable has a uniform warmth (always providing it is sweet and properly ventilated) the horses will have good coats on them, will rest well, be in good condition, in high spirits, and always ready and fit to do any quantity of work; keep temperature at about sixty to sixty-eight degrees. If a horse is not in regular work he must have exercise if health is the object desired. Horses with thick

coats on them will perspire a good deal; even in the stables there is a wet coat, or dew upon it, which has a depressing and weakening effect. Clipping their belly, breast, sides, and legs, leaving the coat on the back, has an excellent effect in keeping a horse in health. Of course, a horse fresh from grass or from the straw-yard should be housed in a cool loose-box for a time.

Conditioning Young Horses.

Young horses brought into town stables and town diet, straight from the breeder—often out of the straw-yard. It is a great and serious transition; he is subjected to an ordeal much greater than is usually thought of. Probably the young horse has been subjected to a course of feeding, etc., preparing him for a certain fair; he is fat, soft, and sleek. The course to adopt, and which is found the safest course to pursue, is to place such young horse in a comfortable loose-box, not too warm, see that his body is kept at a proper temperature; do not give him a grain of corn of any kind for the first fortnight; let his diet consist of chop and bran only. For the first week or fortnight he may have oil-cake, water to drink, and give him exercise daily; then half-days' work for a fortnight, keeping him in stable on cold wet days. Nimrod, speaking of seasoning hunters, says seven years' beans and oats are necessary to complete hard condition; but in these railway times we cannot indulge in such a luxury. The horse must be got to work often when little or no seasoning had been adopted; avoid washing legs when dirty. In light-bred horses let the dirt dry on, after wisping and then bandaging them; when dry brush them well. When horses are working hard do not on any account give them large quantities of raw oatmeal or raw flour. I am quite satisfied these are frequently fruitful sources of Laminitis, and that, too, of the most malignant form. I remember one case especially in which two pairs of horses were engaged in a ploughing match; the soil and field were everything that could be desired, the ploughs were of the most modern construction; the horses were perfect in their knowledge of the work, and their adaptability to the kind of work, their condition everything that could be desired. The day was an intensely hot one; two of these horses—that is, one of the pairs—were allowed to drink raw oatmeal and water occasionally; during the day this pair drank 20 lbs. to 30 lbs. weight of raw oatmeal; the other pair had none, but the two which had oatmeal was attacked the same night with fever in the feet; their suffering was dreadful; in two or three weeks their coffin bones had sunk so much and all laminal attachment destroyed, and both horses were shot; so great is the sympathy between similar tissues, and so strong the nervous excitement. The other pair that had clean water only to drink during their work, kept all right.

I feel I must apologise to you for the brevity of this my paper. I fully intended to make it more worthy of your attention, but in this, as in many other duties I had set myself to do, I have been unable to accomplish for want of time, and as the poet says—

> "Thy pardon, friend, I now beseech,
> In this my prayer, if I offend.
> One something sees beyond his reach,
> From childhood to his journey's end."

An interesting discussion followed, in which the President, Messrs. Olver, Wragg, Malcolm, Parker, Smith, Trigger, and the Hon. Sec. took part.

Votes of thanks were afterwards awarded to Mr. Greaves for his paper, and to Mr. Blakeway, who had exhibited an interesting specimen of diseased heart.

It was decided to hold the next meeting at Birmingham.

The members then dined together, and a very pleasant evening was passed.

T. CHAMBERS, Hon. Sec.

THE SCOTTISH VETERINARY SOCIETIES.

[The following observations made at the recent meeting of the above societies, were not sent with the Report of the Proceedings published in the JOURNAL for March. The discussion was on Contagious Pleuro-Pneumonia.]

Mr. RUTHERFORD was glad he had not anything new to grapple with. He had also heard with greatest pleasure that Prof. M'Call to a large extent admitted his (Mr. Rutherford's) case, and agreed that there should be no retrogression. He could correct Prof. M'Call with regard to matters in Glasgow, but he preferred to pass them by. His position was this—that given a district with this disease, no matter when the operator was called in, if the inoculation was carefully practised on the lines he had laid down, success would be the result. He went further, and said this—that if he went to a stock and carefully examined and inoculated all which he thought should be inoculated; and when he delivered that stock to the owners he would be in the position to say, "Your stock are not only absolutely safe, but they will not communicate the disease to others." If those animals were not inoculated, and the disease allowed to run its natural course, some dying and some recovering, the latter would communicate the disease. By inoculation the propagating power of the disease was destroyed; in fact, the introduction of the outside poison annihilated the inside poison. The power of the disease was also destroyed by inoculation, even though the animal had disease in a small portion of its lungs. He had inoculated during the last eleven years—not in Edinburgh alone, but in many parts of Scotland, thousands of cattle. These represented hundreds of isolated individual outbreaks; and he did not know in the whole course of his experience of one case in which he was able to trace a recurrence of the disease to any inoculated animal. He could take them to scores of byres where Pleuro was rampant before and where the disease did not now exist. (Applause.) Mr. Reid, of Leith, had given him the results of inoculation for two years. That gentleman said he had inoculated 400 cows in twenty-two outbreaks. Of the number only four byres required to be inoculated twice. On both occasions the disease was distinctly traceable from the outside. (Applause.)

ROYAL AGRICULTURAL SOCIETY.

AT the monthly council meeting, held on March 2nd, Sir JOHN THOROLD stated that the following letter had been received from the Agricultural Department of the Privy Council, in reply to one signed by the President, and sent on February 3rd:—

"*February 28th*, 1887.

"My Lord,—Referring to your lordship's letter of the 3rd inst., suggesting that the Privy Council should institute an inquiry into the allegations that the milk of cows affected with eruptive disease of the udder and teats may become a medium of conveying the effective matter of human diseases, such as Scarlatina and Diphtheria, without the agency of a diseased human being, I am directed by the Lord President to inform you that his lordship has given directions that an investigation is to be carried out, as suggested in your lordship's letter above referred to.—I am, my lord, your lordship's obedient servant, (Signed) C. L. PEEL.

"Lord Egerton of Tatton, President of the Royal Agricultural
"Society of England, 12, Hanover-square, W."

The Committee recommended that the following communication should be inserted in the report of the proceedings of the Council:—

"Agricultural Department, Privy Council Office,
"44, Parliament Street, S.W.

"*Danger of Handling Carcases of Animals Dead of Anthrax.*

"Sir,—I am directed by the Lords of the Council to request that you will call the attention of your local authority to the following notice on the subject of Anthrax.—I am, sir, your obedient servant,

"(Signed) C. L. PEEL.

"The Secretary, Royal Agricultural Society of England,
"12, Hanover Square, W."

"NOTICE.

"*Danger of Handling Carcases of Animals Dead of Anthrax* (*Splenic Fever*).

"Several cases of serious and some of fatal infection have occurred in persons who have been employed in cutting up carcases of animals dead of Anthrax, and it is important that the public should be made aware of this source of danger to human life. It is well known that the blood in Anthrax, and all parts of the body containing blood, are highly infective, and persons who have any abrasions, however slight, on their hands or arms should carefully avoid touching any portion of the carcases of animals which have died of this disease, or been slaughtered while suffering from it. The same care is required in dealing with fodder, litter, manure, or other things which may be contaminated with the blood of diseased animals. Carcases of animals dead of Anthrax should be buried entire, without being skinned or cut, and be well covered with quicklime, and not less than six feet of earth."

The Committee had reconsidered the rules, etc., of the horse-shoeing competition at Newcastle, and they recommended that the competition should commence on Tuesday, July 12th. They further suggested that a fourth class (for shoeing roadsters) should be added, with the same amount of prizes as in the other classes—namely, £16.

Professor BROWN had presented the following report:—

"*Pleuro-pneumonia.*

"During the eight weeks ending February 19th, 1887, there were 101 outbreaks of this disease in Great Britain reported on for the first time, and 465 cattle attacked. This shows an increase of 29 in the number of outbreaks, and of 137 in the number of animals attacked, as compared with the corresponding period of last year.

"This increase is entirely due to the continued prevalence and spread of the disease in Scotland. When the returns for the first eight weeks of 1886 and 1887 are compared separately for England and Scotland, it is found that while in England in 1886 there were 54 outbreaks and 278 cattle attacked, in 1887 there have been only 38 outbreaks and 188 cattle attacked.

"In Scotland, during the first eight weeks of 1886, there were only 18 outbreaks, and 67 cattle attacked; while there have been this year 63 outbreaks, and 277 cattle attacked.

"*Swine Fever.*

"From the returns published in the *London Gazette*, it appears that up to February 19th there have been this year 557 fresh outbreaks reported on, and 3,495 swine attacked; during the corresponding period of last year there were 681 outbreaks, and 3,074 swine attacked.

"*Anthrax.*

"Returns of the existence of this disease have been received since the beginning of the year from the following counties in England:—Chester, Dorset, Essex, Hants, Hereford, Kent, Lancaster, Leicester, Lincoln, Norfolk, Northampton, Northumberland, Notts, Somerset, Sussex, Warwick, and York

(W. R.); and also from Forfar, Lanark, and Linlithgow, in Scotland. One outbreak in Essex, in January, assumed rather serious proportions, where 39 cattle, out of a herd of about 60, were attacked, and died in a few days. Some 17 others were slaughtered, and three have remained alive, and resisted the disease.

"The veterinary surgeon who was called in and made the *post-mortem* examination of some of the first cases was infected and became very seriously ill, and at the date of last report, a few days ago, was scarcely considered out of danger. Two other men, who had occasion to handle the carcases, were also affected, but are said to have recovered.

"Specimens of the food and water supplied to the cattle have been sent to the Agricultural Department, and experiments are being carried out in order to ascertain if any of the articles are contaminated with the infective matter of Anthrax."

This report having been adopted, Earl SPENCER thought it would be of interest to not only the council, but also to cattle-owners, to learn from Professor Brown whether there was any prospect of any serious steps being taken in Dublin for stamping out Pleuro-pneumonia, because he (Lord Spencer) understood that an investigation would be made by a Committee of the Privy Council in England, assisted by the Irish Privy Council, to find out whether the disease was confined to the Dublin dairies. A great effort should be made to try and get the disease stamped out in Dublin, as there now seemed to be an opportunity of doing so, and it was interesting to know whether the Privy Council were prepared to act with the Irish Privy Council in the matter.

Professor BROWN said that reports had been furnished by two of their chief inspectors in reference to the state of Pleuro-pneumonia, in which they had come to the conclusion that the disease was apparently confined to a limited area, whose centre was in Dublin dairies. Cases has occurred in the adjoining counties, but the whole thing was confined to a very small area. A communication had been sent to the Irish Government suggesting a course of action, with a view to stamping out the disease. The matter was still under the consideration of the Irish Executive; and he had been informed that a report from their chief inspectors in Dublin was in the printer's hands. That was the present state of the case, and he could not say what action would be taken by the Irish Government.

PROCEEDINGS OF THE RECENT ASSEMBLY OF NATURALISTS AT BERLIN.*

IN the section for veterinary medicine at the meeting of naturalists at Berlin, held on the 18th September, Dr. Fröhmer, of Berlin, read an address upon—

ANÆMIA PERNICIOSA IN HORSES.

The lecturer gave a description of the disease in man, then drew attention to a report by Zschokke upon eight cases of pernicious Anæmia. The animals were old, and several stood in the same stable. The predisposing causes seem to have been: long-standing in the stable, immoderate exertion, and in one case it appeared to result from a severe pulmonary attack. The symptoms were weakness, nervous depression, increased respiration, pallor of the mucous membrane—a typical fever, without disturbance of the appetite, which was very good, as a rule, and without any local disease. The malady terminated after a very long course, in regularly increasing weakness and

* Extracted from the *Wochenschrift fur Thierheilkunde und Viehzucht*, Nos. 40, 41, 42, of October, 1886.

emaciation and death. *Post-mortem* showed general anæmia, emaciation, hæmorrhage, accumulation of iron in the kidneys, hypertrophy of the liver and spleen. The number of red-blood cells was diminished, and showed all the changes in form described as Poikilocylosis. Bacilli were present in the blood. Zschokke's observations leave no doubt as to the identity of the disease with that found in man. The lecturer had met with two similar cases in 1885 and 1886, both of which proved fatal; but he quoted one case where recovery took place. This horse had been long under treatment for a tread, and was about to be discharged, cured, when it became suddenly feverish; the pulse was frequent, the mucous membranes strikingly pale, and the animal was very weak, and there was a copious discharge from its nose. The appetite remained good. On the sixth day the blood contained the usual quantity of red cells, but they were of different size and form. There were no other changes noticeable in the blood. On the ninth day improvement showed itself. The fever was reduced, but the weakness and the pallor of the membranes remained for four weeks. It is interesting to learn that similar attacks had been noticed in the stable before. The lecturer ascribed the origin of the disease to a stable miasma.

The Contagium of Influenza Pectoralis.

Dr. Schütz said there were two anatomical forms of this disease. Firstly, there may be yellow necrotic areas in the lungs and pleura. (In these areas the contagium is seated.) To this may be added a spreading Pleuritis, or a perforating Pleuritis, through softening of the necrotic area and perforation of the pleura.

In the second form the malady does not appear in areas in the lungs; the hepatisation is a diffused one. The first form shows itself as Pneumonia multiplex mortificans, whereas the second is a Pneumonia simplex, resembling Croupous Pneumonia in man.

In the first form an oval bacterium was always found in the area. Mice inoculated with a pure cultivation died of Septicæmia. Three horses received some of the cultivate injected into their lungs; they died. Autopsy showed Gangrenous Pneumonia and perforating Pleuritis. Another horse, inoculated by inhalation, did not die. After a time it was destroyed. *Post-mortem* revealed Chronic Pneumonia.

In the second form (diffuse Pneumonia) the same bacteria are found in the hepatised parts. Therefore both forms are etiologically due to an identical process. As in Croup, there is a fibrous and a diphtheritic form, so in Pneumonia the disease may be a gangrenous or a fibrous inflammation, according to the virulence of the contagium. The same bacteria are always found in sporadic and epizootic Pneumonia.

Meningitis Cerebro-Spinalis in Cattle.

Dr. Schmidt, of Aachen, after stating that literature had hitherto ignored this malady, pointed out that it was divisible into two stages—irritation and depression. At first the animal is restless, shakes its head, but cannot bend its neck. Respiration, circulation, and temperature normal. The irritative stage lasts for twelve to thirty hours. Then tonic spasms of the muscles of the neck, and at times trismus, occurs. The psychæ are undisturbed. Gradually the skin becomes cold, the temperature falls below normal, and the respiration becomes slower. On the second day twitching of the muscles of the back is noticed, and also of the eyelids. The speaker has only seen one case recover. In all the other cases death occurred in six to eight days. Autopsy showed hyperæmia and accumulation of a clear, reddish fluid in the meshes of the pia mater. Nothing abnormal was noticed in the spaces and substance of the brain or spine. Treatment had no result.

Army Veterinary Department.

At the *Levée*, held at St. James's Palace, by H.R.H. the Prince of Wales, on March 1st, the following veterinary officers were presented by the Principal Veterinary Surgeon, who attended the *Levée*: Inspecting Veterinary Surgeon Dr. G. Evans; First-class Veterinary Surgeons Gillard, M. Anderson, Longhurst, Spooner, Philips, Jones, and Veterinary Surgeon R. W. Raymond.

From the *South Australian Government Gazette*, of December 23rd, we learn that His Excellency the Governor has been pleased to appoint Veterinary Surgeon Thomas Chalwin to be brigade veterinary surgeon on the Staff of the South Australian Forces, with the relative rank of major.

First-class Veterinary Surgeon Glover has returned to England from a tour of Indian service, and Veterinary Surgeons Taylor and Dundon have arrived from Egypt. Veterinary Surgeon W. R. Walker leaves Egypt for service in India.

Obituary.

The following deaths have been reported to the Registrar of the Royal College of Veterinary Surgeons:—W. F. Parkes, M.R.C.V.S., late of Bury, who graduated in 1834; James Baxter, M.R.C.V.S., Errol, Perthshire, who graduated in 1843; C. D. Ashworth, M.R.C.V.S., Heywood, Lancashire, who graduated in 1875; T. S. Faulkner, M.R.C.V.S., Rochdale, who graduated in 1876; Edwin Drake, Summersland, Exeter, graduated July, 1831; Edward Meek, Walsall, Staffordshire, graduated April, 1867; Joseph Hudson, London, graduated May, 1866; W. Douthwaite, Beverley, Yorkshire, graduated April, 1864; George Bland, Alfreton, Derbyshire, graduated August, 1879; Charles Tennant, Maybole, Ayrshire, graduated April, 1844.

Notes and News.

Bone-Setting in Dogs.—The *Sportsman* says:—The celebrated greyhound Miss Glendyne met with an accident of so serious a nature whilst running her second course in the Waterloo Cup (Altcar Meeting) that her owner was compelled to withdraw her from the stake. It was officially announced overnight that such would probably be the case; but, in order, if possible, to prevent it, Mr. Hutton, the well-known bone-setter, of London, was wired to and earnestly requested to come at once and examine the bitch. Something was radically wrong, but what her partisans could not make out. The text of Mr. Hutton's telegram was—"Come at any cost;" and come he did—by special train—though he was ten minutes too late, as Miss Glendyne had been withdrawn. On examining the bitch it was found that she had dislocated a small bone in the toe of her near hind-leg; but this Mr. Hutton quickly put to rights, and he declared if she had not been withdrawn she might have gone to slips without the slightest fear of any ill effects arising. Singularly enough, the *contretemps* that befel Mr. Hibbert's Wonder was not the old foot that gave way last year a fortnight before she won the Great Altcar prize; neither had it any affinity with the shoulder she put out a fortnight ago. When the latter accident occurred, Mr. Dent himself took the bitch to Mr. Hutton, who soon set her right. After a single day's rest she was given a gallop, and very soon afterwards was found to be as good as ever. By now the daughter of Paris and Lady Glendyne should have become well acquainted with Mr. Hutton, and no doubt she is, and very grateful too; for after he had finished with her she turned round and showed her appreciation of his treatment in an unmistakeable way.

Disease among Pigs in the United States.—Disease among pigs in the United States was so widely prevalent last year that the losses are officially

estimated at the enormous number of 4,772,478, or 10·3 per cent. of the total number in the country.

AGE OF ANIMALS.—A bear rarely exceeds twenty years, a wolf twenty, a fox fourteen or sixteen. The average of cats is fifteen years, of a squirrel or hare seven or eight years, and a rabbit seven years. Elephants have been known to have lived to the great age of 400 years. When Alexander had conquered Porus, king of India, he took a great elephant which had fought valiantly for the king, and named him Ajax, dedicated him to the sun, and let him go with this inscription :—"Alexander, the son of Jupiter, hath dedicated Ajax to the sun." This elephant was found with this inscription 350 years after. Pigs have been known to live to the age of thirty years; the rhinoceros to fifty. A horse has been known to live to the age of seventy-two, but averages twenty-five to thirty. Camels sometimes live to the age of 100. Stags are long-lived. Sheep seldom exceed the age of ten. Cows live about fifteen years. An eagle died at Vienna at the age of 104 years; ravens frequently reach the age of 100. Swans have been known to live 300 years; pelicans are long-lived. A tortoise has been known to live much above 190 years.

Correspondence.

THE EXAMINATION OF HORSES.

As the enclosed cutting casts a slur on our profession in general, and some of its leaders in particular, perhaps you "would allow it space" in your journal, and thereby let the Members of the R.C.V.S. "see oorsels as ithers see us."

By publishing it you would also give some of the "men of standing" an opportunity of pointing out the difficulties under which they labour while examining horses as to soundness. For instance, no seller would, at any of the numerically increasing auction sales, like three or four veterinary surgeons successively to mount his horse and gallop him until he was as "blown" as if they had been in the first flight through a "Five-and-twenty minutes, and the scent brest high."

Newbury. J. H. WILSON, M.R.C.V.S.

"SOUNDNESS OF WIND IN HORSES.—Writing on this subject in the *Farming World*, Venator says :—Would you allow me space in your paper to ventilate a grievance under which I think all persons (and especially buyers) who have anything to do with the sale of horses suffer—viz., the examination of their soundness as to their wind. Warranty is now going fast out of fashion, and the poor buyer has to put up with a veterinary certificate of soundness, which in seventy-five per cent. of the cases is not worth the paper it is written on. What can a man, however clever he may be, tell of a horse which he has never seen before, which probably has not done a day's work for two months, which he only sees for a quarter of an hour at most, and which he never gets on? This is the point which I think is unsatisfactory to buyer, seller, and examiner, especially the first. I never go to look at a strange horse without repeating to myself—

"'The buyer has need of a hundred eyes,
The seller wants only one.'

"I have now in my mind not one nor two, but several, cases of horses having been sold at a long figure, and passed sound by men of standing in the veterinary profession, which, when ridden in deep ground or against a hill after a gallop, proved to be rank roarers. I maintain that no man is justified in giving a certificate of soundness without galloping a horse; and the profession know well—though some members of it will not, perhaps, admit it—that it is impossible to gain a thorough knowledge of a horse's

soundness in his wind without such a trial. Again, I have had hunters, one of which I rode for many seasons, which invariably grunted on being punched in the ribs, yet was otherwise sound; and the horse I allude to was one of the finest-winded horses I ever rode, and particularly good up hill. Roaring is the curse of old horses, and that it is on the increase I think no one will deny. Although I am a poor man, I will not have a roarer in my stable, however good he may be in other respects. I would rather have no horse at all than ride one, and I only wish, for the sake of the animal we all love so well, that others felt on this matter as I do; but whilst we see noble lords and men supposed to be connoisseurs in horse-flesh riding such animals, there must surely be a market for them. In my young days a three-hundred-guinea hunter (which represents a five-hundred-guinea one in these days) would have been worth twenty pounds only had he made a noise."

CURE OF THOROUGHPIN.

TO THE MEMBERS OF THE VETERINARY PROFESSION.

GENTLEMEN,—I am desirous of making known to you a *certain and permanent*, but simple, cure of "*Thoroughpin*" in the horse.

Before proceeding further, I may say it applies to every class of horse, having treated successfully the racehorse, charger, hunter, hack, cart-horse, and have never failed to effect a permanent cure.

I have testimonials, including one from the Marquis of Lansdowne, which you may have a copy of on applying to me.

In most cases the blemish which remains is scarcely discernible, after the shedding of the coat, one horse having taken a first prize at a local show the same year after being treated.

Firstly, I propose to receive, from any member of the profession, horses with Thoroughpin, on terms and conditions obtainable on application.

Secondly, Having convinced you that it is a *bonâ-fidé* cure, I should open a subscription list, and should I consider the total sum realised sufficient remuneration, I should request you to place your subscriptions with some banking company, in the names of one or more trustees, to be handed to me, after my giving you proof of the genuineness of the cure.

Thirdly, I would then forward to each subscriber, *being an M.R.C.V.S.*, all necessary information, that they may effect cures themselves. I would also give a number of practical illustrations at times and places I will afterwards decide upon.

My object, in this mode of procedure, is to benefit my brother practitioners generally, and at the same time obtain a substantial remuneration myself, without resorting to the quackery of advertising, thereby benefiting only myself.

Hoping the above will meet your approbation.—I am, gentlemen, yours faithfully,

J. CHARLES COLEMAN, M.R.C.V.S.

Chippenham.

A CASE OF FIBRO-MYOMA.

SIR,—In relation to the case of Fibro-Myoma, recorded by me, and published in the VETERINARY JOURNAL, page 10 of the present volume, a Mr. William Littlewood, M.R.C.V.S., hailing from Cairo, asks me some seven questions. Having satisfied myself that he is what he describes himself, a "Young Practitioner," I shall be glad, with the aid of the limited knowledge I am possessed of, to briefly answer his questions. I shall not take up your space by requoting the interrogatories, but simply answer them *serialim* as numbered.

1. Indigestion very frequently produces Hæmaturia in cattle, less frequently in the equine species, from the animals eating certain products, derived from the vegetable kingdom, of a toxic quality; whether the poison is of the irritant or narcotic type, I am not able to satisfy myself, but am inclined to the latter view, and, if I am correct, Hæmaturia, as a result of Indigestion, is caused by nervous sympathy.

As it is not my intention in answering these questions to raise questions of a contentious character, I will state what I mean, by giving one illustration, founded on my own experience. Near to my place is a woody pasture, on the Hilbeck Hale estate, extending to something like 200 acres, which is notorious for cattle becoming affected with Hæmaturia, or "Red-water," if turned into it to graze, so much so that the occupiers of the farm dare not turn any cattle into it, at least during the summer months. In the spring of 1879 the occupier of the farm turned some horses into it. On May 2nd of that year I was called to treat one of them, which the farmer said was affected with Red-water. I gave her a drench of Ol. terb. in Ol. lini.; the water was clear next day, and the mare did well. On November 31st, same year, I was called to treat another of these horses, which evidently had been suffering for two or three days before being seen. I administered the same medicine as in the previous case. One drench cleared the urine, but as there was a good deal of weakness from the drain, I administered tonics—Ferri carb and gentian. This animal made a good recovery.

In cattle suffering from Red-water, I have in my practice found small doses of Ol. terb., administered after the stomach and bowels are cleared, a great assistant in clearing the water (urine) from blood. As to what the toxic agent is in this wood, and also, I may say, in a pasture of my own, which adjoins, I cannot say. The wood growing is composed of birch, ash, hazel, holly, mountain ash, briers, and possibly a lot more shrubs and plants which would tax the knowlege of a professor of botany to define. In my own pastures, and some more adjoining, there is nothing but birch and hazel, and cattle cannot be grazed in any of them without danger of becoming affected with Red-water or Hæmaturia. As indigestion, resulting in acute constipation, is a prominent feature, and undoubtedly the primary cause, of "Red-water," Mr. Littlewood will excuse me even giving my opinion, physiologically, as to how bleeding from the kidneys is brought about.

2. The second question is answered in my remarks on the first; but I may add Ol. terb. "is a valuable remedy for bleeding of all kinds, whether it be from stomach, bowels, lungs, nose, womb, kidneys, or bladder," and its influence over bleeding from the kidneys is regarded by authorities as of a special character.

3. Mustard would not in any way arrest bleeding from the kidneys in the case alluded to; it was simply applied as a counter irritant in an undiagnosed case of Uterine Fibro-Myomata.

4. Seeing that the filly had had already a pint of Ol. lini. and a strong purging ball given her, it was, in my opinion, independent of relieving pain, absolutely necessary to put some restraining action on the physic in order to avoid superpurgation. No better agent than Tr. opii was at hand; the Plumbe acid, not being incompatible with the drench, was thrown in to take its chance, with a view to stop hæmorrhage.

5. My experience of hypodermic injections of morphia to relieve pain is not large, but what I have seen has left an unfavourable impression on me, the after symptoms being of a more alarming character than those of the disease intended to be combated.

6. The use of a catheter to a distended bladder in a mare or filly, where no organic change of structure is suspected, would not in the least assist me as to diagnosis, because in ninety-eight cases out of a hundred I can, by a much

more simple operation than that of introducing a catheter into a raw filly very little handled, clear out the bladder; besides, generally speaking, veterinary surgeons here don't usually carry a full stock of instruments with them to every patient, and they are more or less guided by the credibility of their clients as to the history of a case.

7. The tumour in the uterus was not suspected till it made its appearance *per vagina*, but had it been, there would have been no reason to test with a catheter, as hæmorrhage from these growths is a constant concomitant symptom in the human subject, and the same rule exactly applies in the lower animals. As to Mr. Littlewood's concluding remarks, about a tumour in the uterus producing such injury by pressure on the kidneys as to cause a flow of blood being "difficult to believe," it would be quite easy for me to manufacture a physiological hypothesis that would meet the view, especially when the animal is in the recumbant position. But I will not take up your space with matter of a contentious character. I will allow Mr. Littlewood to view this aspect of the cause of red urine *cum grano salis*.

In concluding this letter, I may just state that the filly is now in the hands of the breaker, and has done well ever since the operation. And now, Mr. Editor, seeing I have, instead of being in bed and asleep, spent about an hour in doing my best to try to enlighten Mr. Littlewood, I think it would only be fair of him if he sent me free some not very money-valuable memento from the land of the Pharaohs, so that I could treasure it up in memory not only of the donor, but as satisfaction that I have at least done some good in my lifetime. I should not care to have a mummy sent, but perhaps I shall be met with the retort, "beggars should not be choosers."

Burtergill, Warcop, March 11th, 1887.

JNO. HARRISON, M.R.C.V.S.

A CORRECTION.

DEAR SIR,—In your report of the special meeting of the Council of the Royal College of Veterinary Surgeons, held on February 17th, 1887, I am reported to have said (page 181): "The Council sincerely regrets that it has been unable to discover the ringleaders in the recent riots by veterinary students in Edinburgh; and it further regrets that no assistance has been afforded to the said Council, by the teachers of the SCHOOLS, to enable it to deal with the guilty students." Will you kindly allow me to say that I used the word *school*, not *schools;* it is but fair to Professor Williams, his teaching staff, and the students of his College that this correction should be made.

Maidenhead, March 12th.

JAMES FERGUSON SIMPSON.

RIOTOUS STUDENTS.

SIR,—Should this reach you in time, perhaps you will kindly oblige me by inserting it in the first issue of your valuable journal.

The public press of Edinburgh seem a little one-sided in dealing with the riotous conduct of the Clyde-street students, and it is but natural to suppose that a reliable expression of the sentiments of veterinary surgeons through the medium of their own journals will prove welcome to yourself and the examiners generally, as a means of enabling them to correctly gauge the opinion of those most directly interested in all matters connected with the profession. I hope, trust, and believe that (independent of what school veterinary surgeons may have been taught in) the examiners may rest fully assured that from John O'Groats to Land's End every man of any standing is firmly at their back—whatever the public press of Edinburgh may, by wire-pulling, do their little best to make appear otherwise.

Inside and outside the profession I believe that there are few thoughtful men

who do not feel sorry for the wayward, ill-advised youths; sorry that able, upright men, while engaged performing highly important public duties, should be grossly insulted; sorry that the oldest veterinary school in Scotland should be for ever disgraced; and more sorry still to be forced, however reluctantly, to the conclusion that the alleged damaging charges against one, if not two, teachers accounts for much that is otherwise incomprehensible to the ordinary mind.

A GRADUATE OF GLASGOW VETERINARY COLLEGE OF MANY YEARS' STANDING.

Scotland, February 23rd.

SIR,—Allow me space in your next issue for a few comments on your observations in the March number, in reference to the unfortunate disturbances by students at the last examination in Edinburgh.

In the first place, I would ask why—in the report of the meeting of Council, held on the 17th ult.—the remarks made by me were not as fully detailed as were those made by other speakers? There was a shorthand writer present for the purpose of noting what was said, and, I presume, also supplying a transcript thereof; and the curtailing of my remarks is an injustice, to say the least of it, to myself.

In the second place, allow me to state what I have already *emphatically* stated, but which for some reason or other the President of the R.C.V.S. and you have persistently ignored—that my colleagues and myself have on every available opportunity reprobated the conduct of the Edinburgh students, and have expressed, as have also our pupils, our sincere regret that such an unseemly demonstration should have taken place.

Thirdly, I stated distinctly that I did not feel myself called upon to set up an inquisition in the college, nor did my past experience of the results of such a course in other institutions lead me to expect that any good could be derived therefrom; and I further stated that the tone of the two letters, addressed to me by the secretary of the Scottish section of the Board of Examiners—by, I presume, direction of the chairman—was not such as should have been indulged in towards any one in my position, as they *each contained a threat*, and one, inferentially if not actually, *put the whole blame of the disturbances on the students of this college*—a charge not in accordance with facts.

In your editorial, you take the trouble to put in parentheses—I suppose with the view of giving it greater prominence—the following remark "(who," the Principal of the Dick School, " strange to note, was invisible and silent during the disturbances)."

I gave, at the Council meeting, reasons for my absence; but in order that my professional brethren may have something more than one-sided statements to guide them, I will give them fully here.

During the whole of the Christmas vacation I had been working hard to prepare my class for examination. I had not taken one moment to myself for the purposes of recreation or rest, and had neglected my private affairs. I attended the examinations on the day my own men were examined, and, afterwards, I conceived I had a right to seek the repose and recreation of which I felt so much in need.

Moreover, I was so depressed by the results of the examination—*as I had, I thought, every reason to expect something very different*—that I had not the heart to go back to the examination room; and on the second day I was labouring under the impression that the examination closed at two o'clock, p.m., long after which hour I was engaged in performing my professional duties. As to the charge which has been made, to the effect that I have not attended the examination closely, I admit that I have not done so recently,

and I have given my reasons therefor. I have more than once publicly, as well as privately to some of the examiners, stated (and have regretted the necessity for doing so) that the pleasure and profit at one time desirable from such attendance was a thing of the past; nor do representations made by teachers always receive the attention they deserve.

You state that no reference—by way of complaint in connection with the examinations—has ever been made at the Council Board; I must ask you, sir, to re-peruse the reports of the proceedings of the Council meetings during the last few years, and see whether this statement is in accordance with either implied or actual fact.

There are other points in your editorial to which I might refer, and which I might controvert; but these will doubtless receive attention from another source, from which also I hope authoritative statements for the guidance of the profession will emanate. In the meantime, I again repeat—lest I be misunderstood or misrepresented—that I, in common with my colleagues and others connected with this institution, deeply deplore the recent disturbances, and strongly condemn the same; but, while doing this, I must also deplore the action of our representative body, or a section of it, in punishing the innocent for the guilty; and I must also deprecate the use of veiled and open threats which have been of late so freely indulged in; though they break no bones, they are not desirable weapons to handle.

THOMAS WALLEY, *Principal.*

Royal Veterinary College, Edinburgh,
March 15, 1887.

[The report of the R.C.V.S. was published as furnished by the shorthand reporter. We decline to discuss this matter with Prof. Walley, maintaining, as we do, that the position he assumed in the affair is inexcusable. He and his *alter ego* are greatly to blame, in our opinion, for the discredit thrown upon the profession and the disgrace heaped upon the Dick College.—ED. V. J.]

TO CORRESPONDENTS.—A number of communications and reports of Societies are unavoidably held over to next month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from R. W. Burke, A.V.D., Cawnpore; J. H. Wilson, Newbury; J. C. Coleman, Chippenham; A. Leather, Liverpool; Messrs. Gresswell, Louth; R. S. Barcham, Norwich; A. Broad, London; H. Kidd, Hungerford; J. Macqueen, Glasgow; H. Sumner, Liverpool; D. C. Pallin, A.V.D., Dorchester; J. Smith, Huntingdon; J. Harrison, Warcop; T. Chambers, Dudley; N. Smith, London; J. Armstrong, Penrith; Professor Walley, Edinburgh; J. A. Nunn, A.V.D., Natal; W. F. Weese and R. Brady, Ontario; J. E. Rayen, Ontario.

BOOKS AND PAMPHLETS: *M. Rieck*, Literaturgeschichte der Blattern und Kuhpockenimpfung; *M. Rieck*, Die Animale Vaccination und ihre Technik; Bulletin et Mémoires de la Société Centrale de Méd. Vétérinaire; *A. Postolka*, Geschichte der Thierheilkunde; *R. Burke*, A Report on Remittent Anthrax.

JOURNALS, ETC.: *L'Echo Vétérinaire; Pesterreichische Zeitschrift fur Wissenschaftliche Veterinärkunde; Der Hufschmied; Repertorium der Thierheilkunde; Revue Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Recueil de Médecine Vétérinaire; Annales de Médecine Vétérinaire; Medical Review; Journal of the Agricultural Society of Victoria; Quarterly Journal of Veterinary Science in India; American Live Stock Journal; Lancet; Medical Press and Circular; Live Stock Journal; Edinburgh Medical Journal; Journal of the Society of Arts; American Veterinary Review; Mark Lane Express; Journal de Médicine Vétérinaire.*

NEWSPAPERS: *Haddingtonshire Courier; South Australian Government Gazette; Agriculture; Dalkeith Advertiser; Scottish Leader; Scotsman.*